PAPER TRADE JOURNAL

JUNE 5, 1961

Exclusive! Operating Report On Stainless Steel Fourdrinier Wires

Step-by-Step (48 in all, count 'em) Guide to Sizing Vacuum Pumps

Rein-In on Price-Cutting, Warns Pundit of Corrugated Box Business

Insuring Against the Sick Disk Refiner in Stock Prep Rooms

Contents of the Week, pages 4-5

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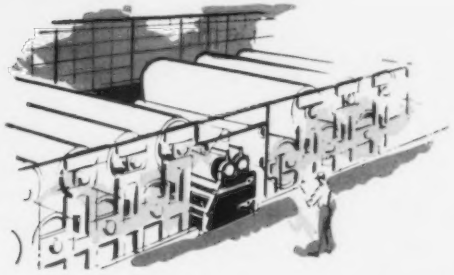
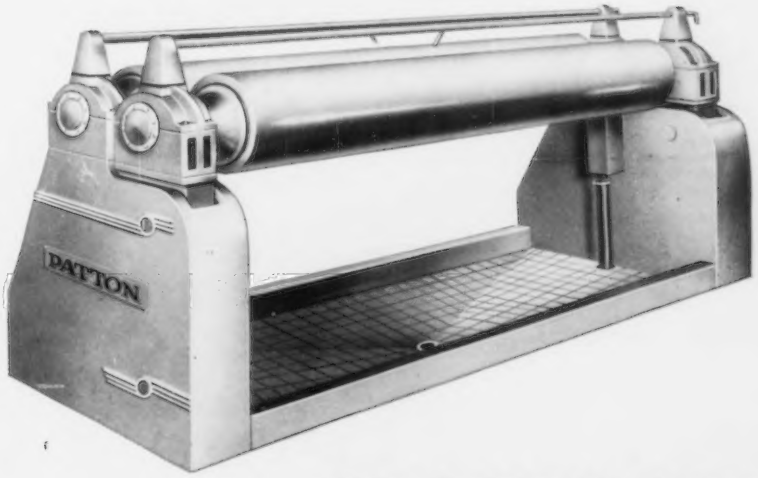


HORIZONTAL SMOOTHING BREAKER SIZE PRESSES



by PATTON

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Photograph taken with cooperation of The Sorg Paper Company, Middletown, Ohio, and American Tag Company, Chicago, Illinois.

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An annoying problem for meat packers was labeling hot, freshly skinned beef. Ordinary labels wouldn't stick. Notations were blurred by the grease. The only answer was tags applied with metal "deadlocks" or hooks—a costly, time-consuming operation.

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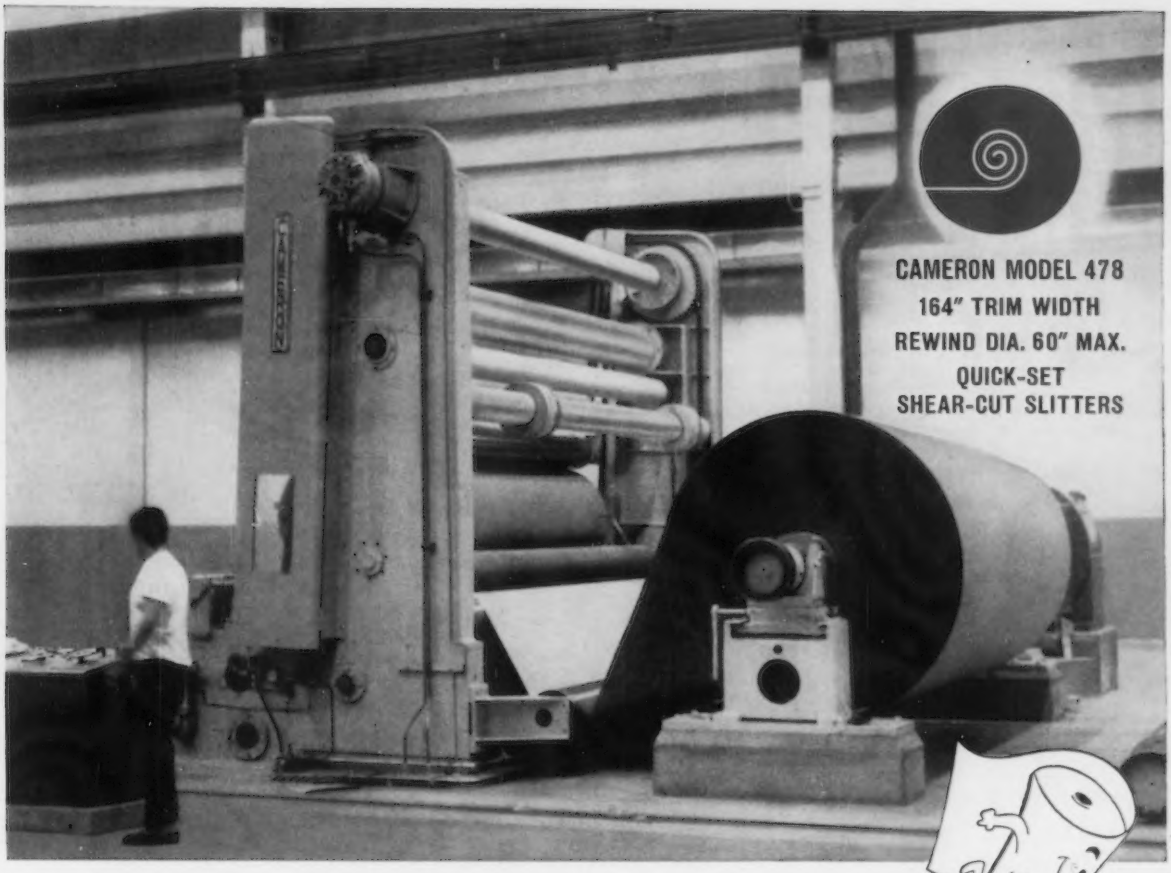

Georgia-Pacific *delivers* ---------- *the superb running qualities of* The New Roll

One good reason why the Georgia-Pacific Paper Company has experienced such rapid growth as a kraft producer for West Coast and export markets is found in the superb running quality of the rolls shipped from the No. 2 machine at the company's Toledo, Oregon mill. Kraft papers and board up to 33 lb. basis weight are delivered in rolls made with extreme care to assure maximum trouble-free yield in high speed printing and converting operations. Also integrated roll control keeps the web *alive* for better end results, not stretched out *dead* in the rolls.

These fine Georgia-Pacific rolls are produced on a Cameron 478 unwinding-slitting-rewinding system, integrated and job-fitted by Cameron specialists for optimum unwind-to-rewind roll control. The heart of this Cameron 478 installation is a regenerative electrical unwind braking system which teams the main winder drive and an unwind braking generator under electronic amplifier controls to provide highly sensitive, continuous response to variations in web tension.

Among other roll control elements of the Cameron 478 are the isolated main drive gear box, down-pressure riding roll brakes, and cam-controlled, tapered automatic counterweighting. All roll control elements are adjustable to the characteristics of the paper or board to be run, the quality of the parent rolls, and the intended service of the finished rolls. The result is a fundamentally different kind of finished roll—a custom-made roll of superb running quality. We call it The New Roll.

Cameron specialists offer a unique test-run service to help you achieve the fine running qualities of The New Roll. In the Cameron Research & Development Service in Dover, N. J., test-runs are being made on all types of papers and board on integrated pilot systems which simulate actual job conditions. Here you can see, before you buy, either an improvement element, such as a new unwind brake and tension system, or a complete, integrated roll production system, engineered to give you The New Roll. Let's plan an early date for *your* test-runs. Write for details.

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AA-392

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Week of June 5, 1961
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FEATURED THIS WEEK

Stainless Steel Fourdrinier Wires Now in Regular Operation

Packaging Corp. of America has been experimenting with all stainless steel paper machine wires since 1957. With the solution to seaming problems these new wires have proven very advantageous for them—John L. Ham **36**

Paper Industry Cited for "Unhealthy Dependence" on Population Growth

The "new use" area will be the battleground of the future in relation to competitors with substitutes for paper. **38**

Procedures for the Care of Disk Refiners in the Stock Preparation Room

Good preventive maintenance consists of following a routine inspection of equipment during operation, with the necessary repairs being made at the earliest possible date—Ray Clay and David Sharp **40**

Accurate Centrifugal Vacuum Pump Sizing

A handy guide for papermakers and engineer alike, written by fluid dynamist J. C. Schildwachter **44**

What is Wrong with the Corrugated Box Business

. . . and what should be done about it. Author Carl Holzheimer very frankly points out that competition should be in the areas of quality, service and product improvement rather than by price cutting. **49**

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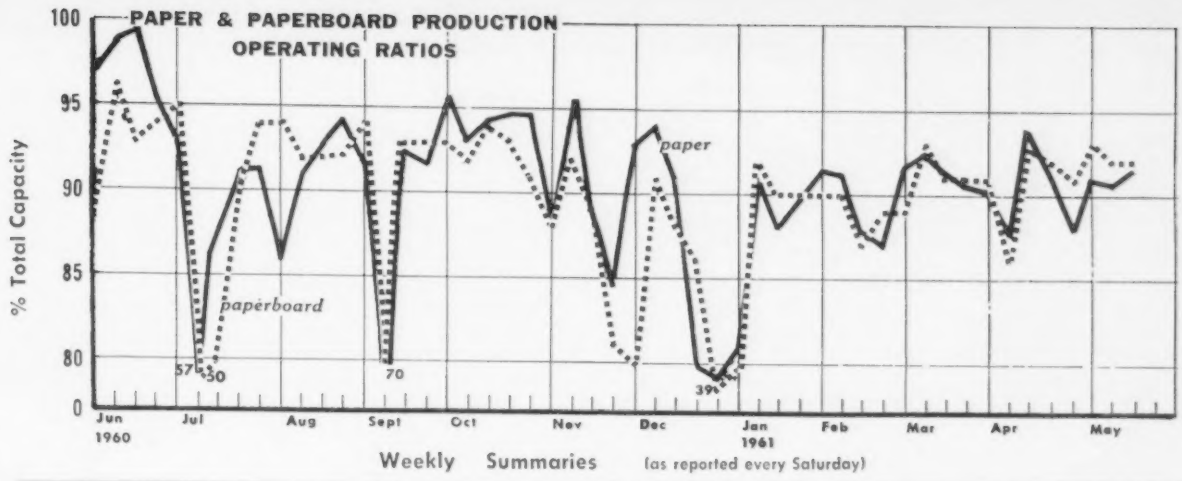

NEWS OF THE WEEK

Menasha Brings New Corrugating Mill into Production . . . Proposed B. C. Pulp Mill Reported Nearer . . . New Vice Presidents for Columbia River Paper Co. . . . Kokusaku Pulp Industry Making Clupak in Japan . . . Denver Bag Firm To Occupy New Plant . . . . . **News of the Industry** *27*

Penobscot Appoints Pulp Sales Representative . . . Wisconsin Information Service Elects Chairmen . . . Elliott Joins Wausau As Atlanta Sales Rep. . . . Scott Fills New Post in H&W Organization **Paper People** *30*

Centerwind Drive System Maintains Rewind Tension . . . Commercial Availability of Butyl Latex Announced . . . Belt Fasteners for Small Pulley Drives . . . Portable Speed Drive in 25-40 H.P. Ratings . . . . . **New Equipment & Supplies** *32*

Figures of the Week *52*

New Literature *52*

Prices of Fibers *54*

News of Suppliers *58*

Obituaries *60*

Classified Advertising *62*

Advertisers Index *66*

REMEMBER THESE DATES

Paper Industry Management Ass'n National Meeting, Robert Meyer Hotel, Jacksonville, Fla.	JUNE 7-9
Technical Section Canadian Pulp and Paper Ass'n Summer Conference, Saranac Inn, Saranac, N. Y.	JUNE 7-9

NEW HONEYWELL TRANSMITTERS

New bellows flow transmitter

gives all the economy and convenience of pneumatic transmission and all the efficiency of the bellows meter body with the added option of field indication. The transmitter has 16 ranges (0-10 to 0-400 inches of water) and is used to transmit flow or liquid level measurements in open or closed tanks.

Transmitter Features: Make range changes in the field simply by replacing a single spring assembly. You can adjust damping quickly and accurately while the instrument is in operation. You can install meter with vertical or horizontal piping, so that it vents, drains and purges itself.

New temperature transmitter

offers thermal system options with ranges from -125° to 1000°F. Completely new, completely flexible, this transmitter gives you a choice of either mercury or gas actuated thermal system with a wide selection of measuring bulb styles.

Transmitter Features: Mount transmitter on a pipe welded to flow line or on a bracket that clamps to hex head of socket. Vibration resistant thermal system means accurate measurement on vibrating flow lines.

Added Features of both Temperature and Bellows Flow Transmitters include: automatic ambient temperature compensation; two-way overload protection for 100% of span; modular construction for simplified maintenance; self-locking feature to prevent upset; die-cast aluminum case 4″ x 7″ x 9″; available with concentric scale or as non-indicator; transmission accuracy ±0.5% full scale; accuracy of indication ±1% full scale.

For more complete details on the new Temperature and Bellows Flow Transmitters, call your nearby Honeywell field engineer. Or write MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa. In Canada, Honeywell Controls, Ltd., Toronto 17, Ontario.

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PEARL PLUS requires appreciably less enzyme to convert to a given viscosity than regular enzyme converting starches. Converts at higher solids. Converts more rapidly, often eliminating temperature holding cycle. Standardizes quality with more consistently uniform final viscosities after conversion.

PEARL PLUS is an important new development in improving cost-quality relationships. It has been thoroughly proved in extended mill runs. We'd be pleased to discuss its advantages with you more fully.

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ANNOUNCEMENT BY THE W. S. TYLER COMPANY:

Major cost reduction possible with new stainless steel Fourdrinier wire

Flexibility comparable to softer metals is achieved with this new Ty-Flex stainless steel Fourdrinier wire.

A completely new type of Fourdrinier wire, called Ty-Flex*, is now available from The W. S. Tyler Company. Ty-Flex* represents a major breakthrough in Fourdrinier wire design—it is the first successful wire to be made of stainless steel warp and shoot.

For example, in a semi-chemical plant producing corrugating medium, Ty-Flex wires have lasted *several times longer* than the best available wires previously used. Ty-Flex promises significant cost reduction in any paper plant where corrosion and excessive abrasion are serious problems.

Ty-Flex wires have flexibility comparable to bronze wires, permitting high speed flexing on Fourdrinier machines. Check Tyler now for more information. Ty-Flex is available in regular meshes and wire diameters; may be used on your Fourdrinier machines without modification.

**U. S. and foreign patents pending*

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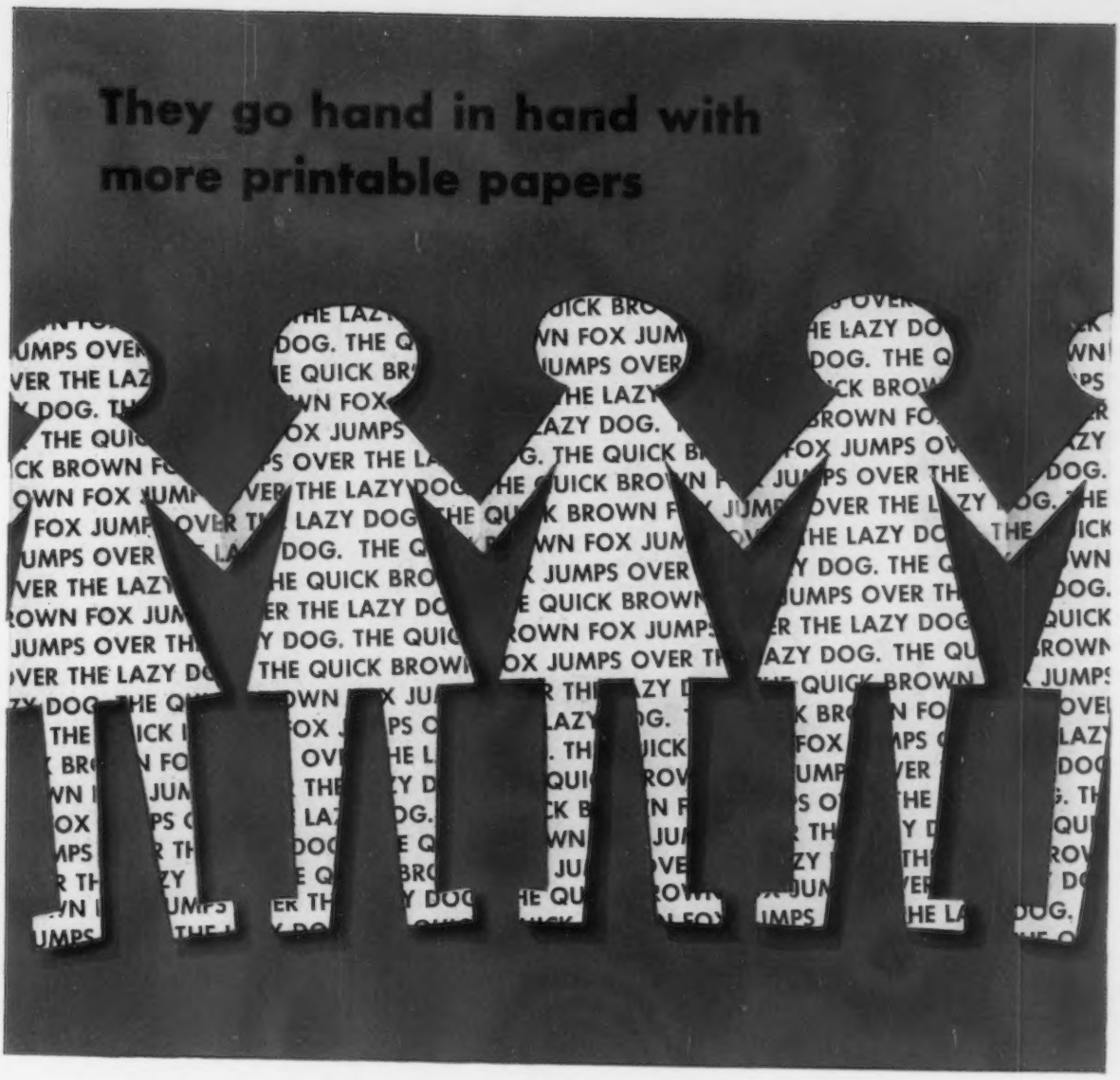
TYLER



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GELVA C-3 and C-5 Copolymer Resins provide improved wet strength, surface erasability, ink receptivity, surface gloss and grease and abrasion resistance. Add to these . . . increased Mullen, wax pick, tensile and fold strength, plus easy broke recovery, and you have the reason for the rapidly increasing use of these products by the paper industry.

Coast-to-coast warehousing, Shawinigan's large staff of research chemists who are ready to help you with your particular problems, and highly trained field representatives add up to an organization that can help you improve your products and your profits. Write to Shawinigan Resins Corporation, Dept. 7-H Springfield 1, Massachusetts.

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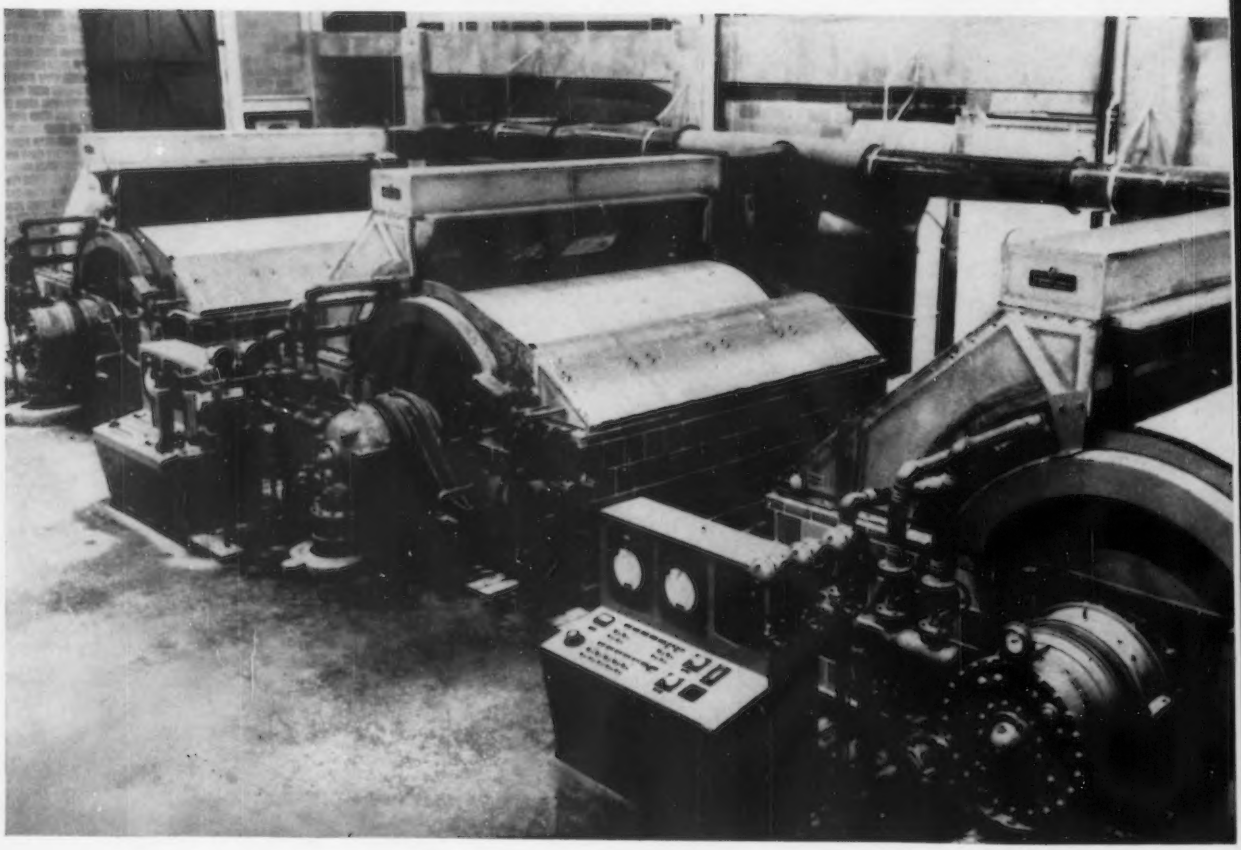
GELVA® *polyvinyl acetate resins by* **SHAWINIGAN RESINS**®

Complete Dorr-Oliver Continuous BLEACHING SYSTEM

installed at
St. Lawrence Corporation, Limited



WHEN the old-established St. Lawrence Corporation, Limited decided to add a bleach plant to its newsprint and kraft liner board mill at Red Rock, Ontario, extensive investigation resulted in the choice of a Dorr-Oliver Continuous 3-Stage Bleaching System. Advantage was taken of the local engineering and manufacturing services of Dorr-Oliver's associated Canadian company, Dorr-Oliver-Long Limited, which supplied all equipment.

The washing system comprises three 8′ dia. x 12′ face washers, designed for an ultimate capacity of 200 tons per day. The first is a rubber covered chlorination washer, which includes a press roll. The second stage is the caustic extraction washer, constructed of stainless steel for possible future chlorine dioxide service. The third and final stage is a rubber covered hypochlorite washer. All washers have double roll dischargers and are in tile vats with fibreglass hoods.

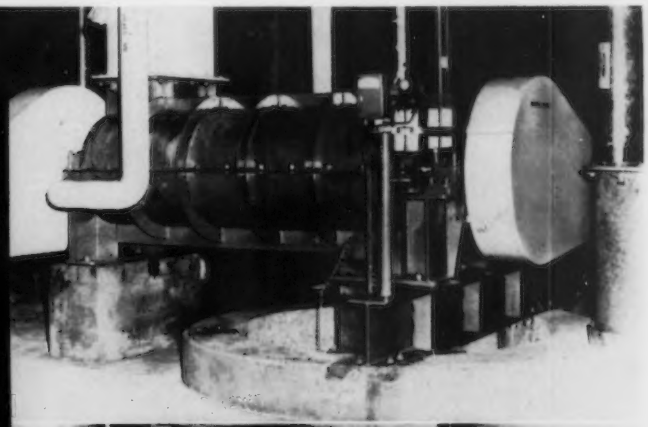
For complete coordination of all phases of the bleaching operation, choice was also made of a Dorr-Oliver rubber lined chlorine mixer, two heater mixers and circulators for the caustic and hypo towers.

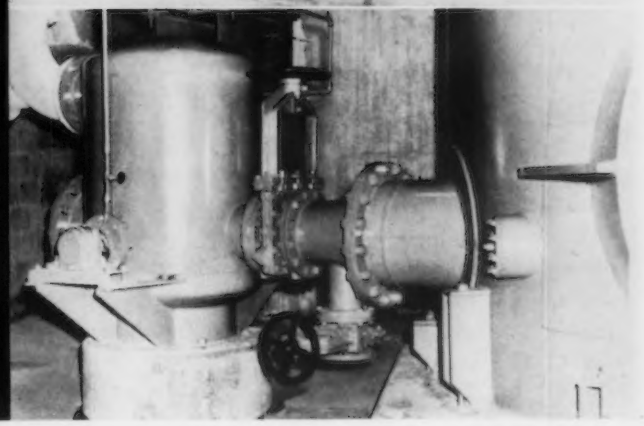
This installation is another example of the world-wide engineering and equipment service offered by Dorr-Oliver to the pulp and paper industry. Complete systems or individual equipment units can be supplied for bleach washing, brownstock washing, deckering and thickening, screening, recausticizing, sheet and board forming, fibre recovery, waste treatment and SO_2 production. For information, write Dorr-Oliver Incorporated, Stamford, Connecticut.

3-STAGE DORR-OLIVER WASHING SYSTEM installed at St. Lawrence Corporation, Limited.

HEATER MIXER (2 supplied) is 24″ diameter, with double shafts carrying alternate propelling vanes and agitating pins. This Dorr-Oliver design is recognized as the outstanding unit of its type in the field today. Reinforced shell is stainless steel.

CHLORINE MIXER has two 18″ two-bladed adjustable pitch propellers mounted on a common shaft, providing maximum agitation and intimate chlorine mixing. Glass window provides for visual inspection. Flange mounted stuffing boxes are rubber lined and rubber covered.





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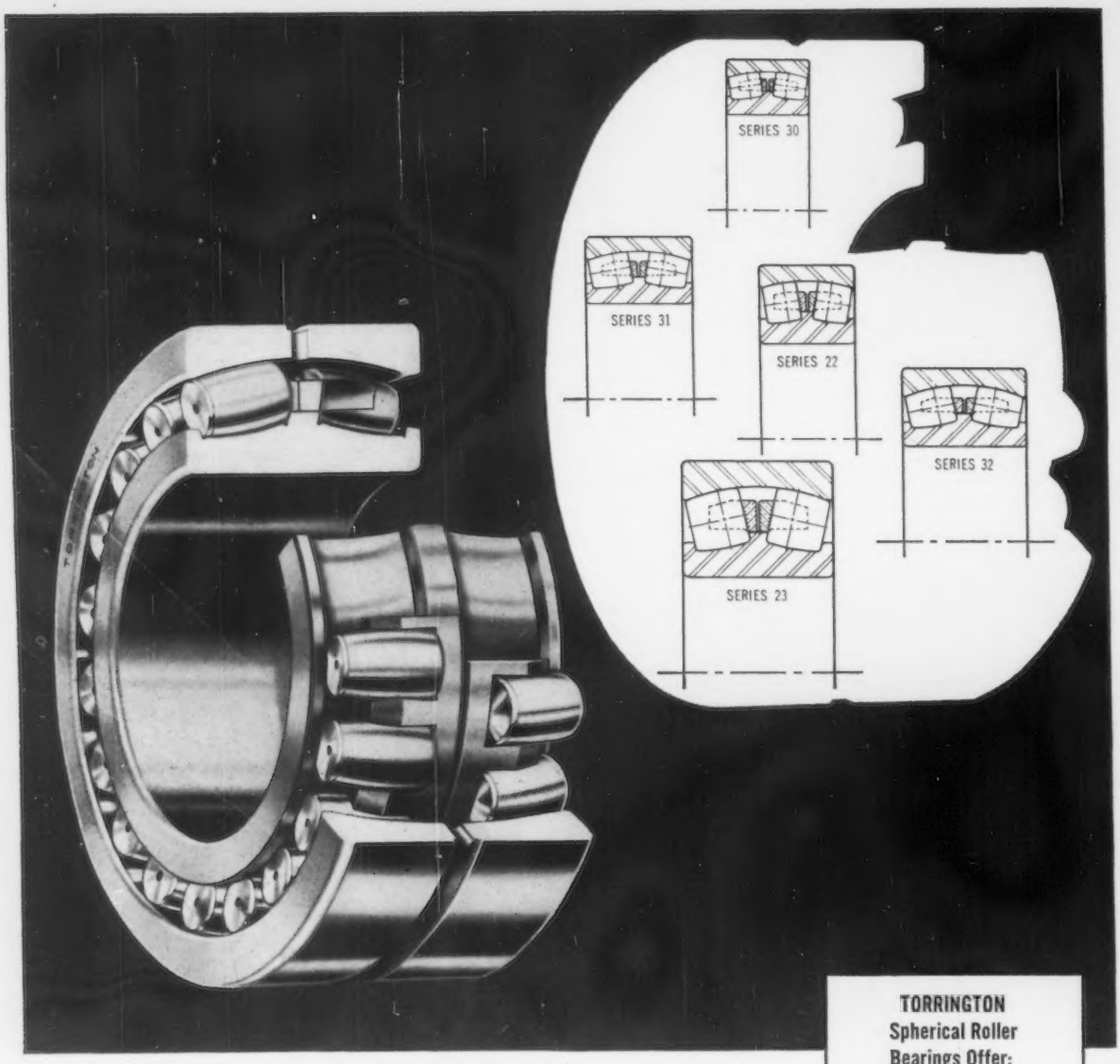

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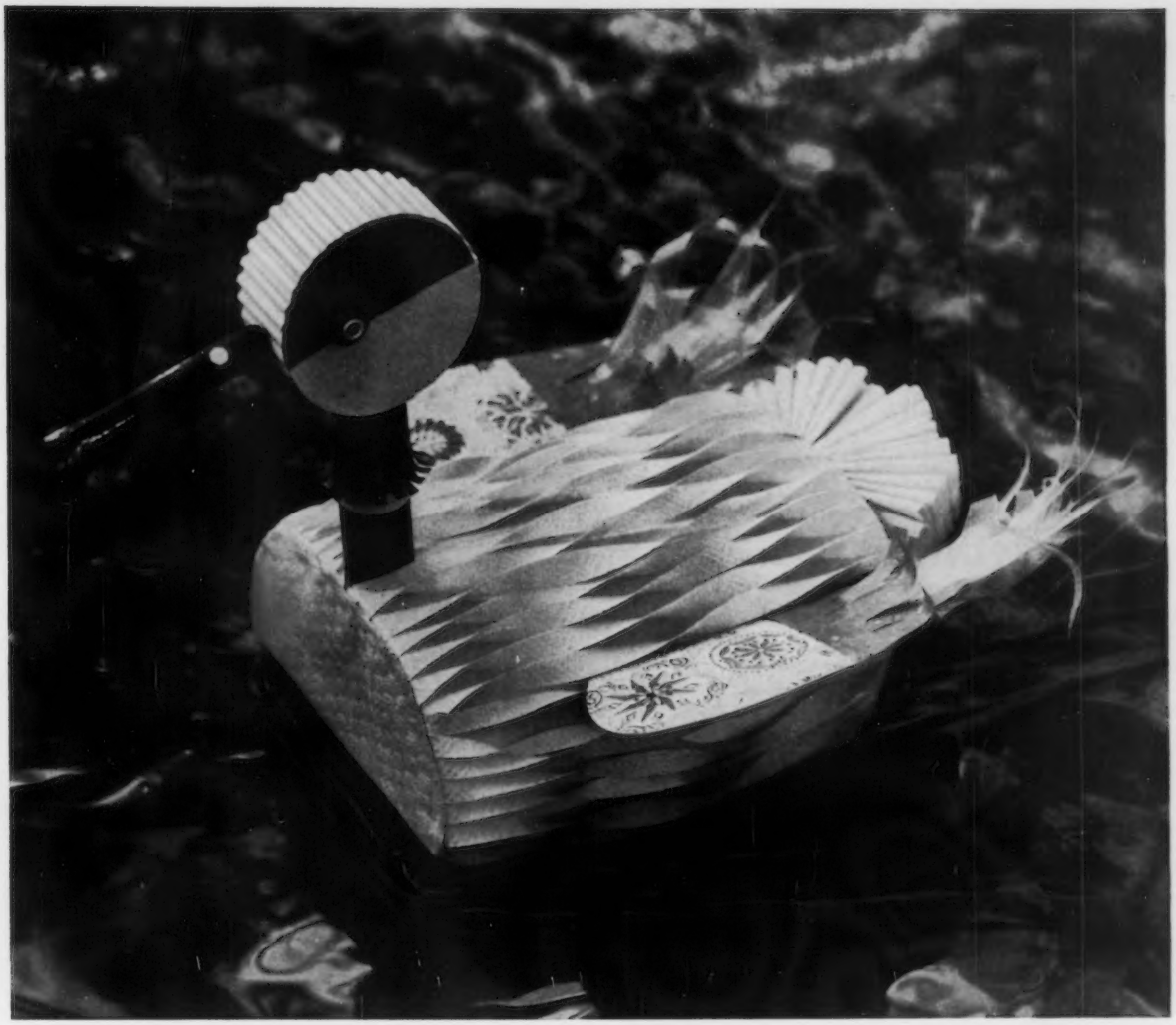

Paper Sculpture by Robert R. Jackson

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Whether you need wet strength for toweling, bag paper, napkins, paperboard, wrapping paper, or specialty items, there's a UFORMITE resin designed to give good results at a reasonable cost. You also get excellent storage stability, ease of handling (no acid pretreatment needed), and easy broke recovery.

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UFORMITE 700—high off-the-machine wet strength without the broke recovery problems caused by other types of resins.

UFORMITE 711—efficient all-round performance at low cost.

UFORMITE 467—maximum economy in unbleached papers.

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UFORMITE

RCA introduces a cost-saving new

Electronic Paper Inspection System

for detecting creases, calender cuts, holes, spots and gloss imperfections

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The surface of the paper is continuously monitored as it passes over a roller at linear speeds up to 1000 feet per minute. In this manner, creases, calender cuts, holes, spots, gloss imperfections, etc. are detected and the paper may be classified in such categories as "Accepts" and "Rejects," or "Firsts," "Seconds," and "Rejects," depending upon customer requirements.

This RCA equipment is completely transistorized and employs plug-in modules for greater reliability, simplicity of replacement and ease of maintenance. Installation supervision and services by RCA Service Company are available. Get complete information on this modern cost-saving equipment. Write to RCA, Industrial Controls, Dept. W-408, Bldg. 15-1, Camden, N.J. Or contact National Representative: Southworth Machine Company, 30 Warren Ave., Portland 2, Maine.

- All controls mounted in one rack.
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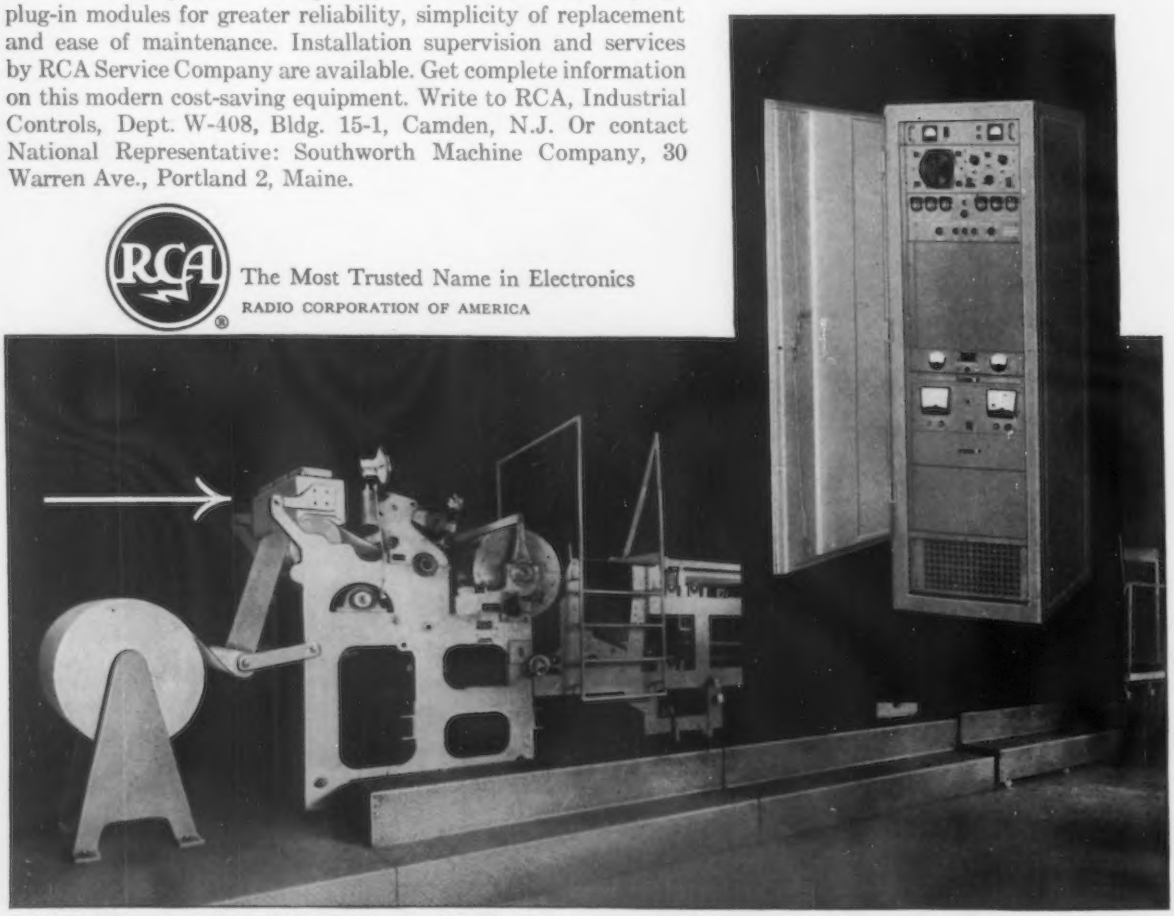


RCA Electronic Paper Inspection System installed before the cutter, and on a Maxson Sheet Handling Apparatus. Inspection head is indicated by arrow at left, control rack is shown at right. NOTE: Only one inspection head and one control rack are needed for detecting all types of defects. Control rack can be located remotely from inspection head.

FOR INFORMATION ON THIS OPTICAL PAPER INSPECTION SYSTEM WRITE

SOUTHWORTH MACHINE CO.

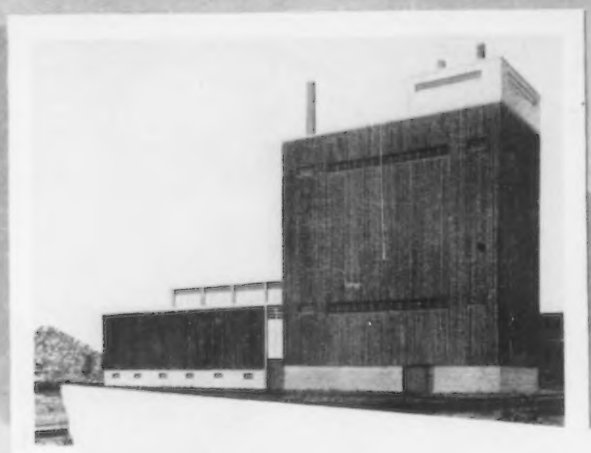
RCA NATIONAL REPRESENTATIVE, 276 WARREN AVENUE, PORTLAND, MAINE

The appointment by RCA as national representative for its Optical Paper Inspection Equipment marks another step in Southworth's objective of providing paper mill management with a comprehensive service aimed at cost reduction.

As you will read in RCA's story on the opposite page, this new equipment brings to the vital finishing room operation of inspection a speed and an accuracy heretofore unavailable because of human limitations and fallibility.

How you might incorporate RCA Optical Paper Inspection Equipment as part of a more efficient and completely integrated Southworth finishing room System is still another reason for considering an early Southworth study of your particular plant problems and requirements.

Paper Conditioners; Automatic Carton Sealer; Lift Tables; Air-Lift Tables; Cutters; Deliveries; Layboys; Skid Turners; Hand, Foot, Motor Driven Punching Machines; Humidifiers; Envelope Presses; Punch Heads; Tabbing Knives; Corner Cutters; Custom Built Allied Equipment.



a **NEW KRAFT** reaches the market

CHLORINE DIOXIDE BLEACHED FOR HI-BRIGHTNESS

To paper mills dependent upon market pulp, Penobscot, America's oldest market pulp mill, now offers a constant source of uniformly high quality pulp from America's newest kraft mill. The entire production of Penobscot's new $5 million plant addition will be available for market sale. The new spruce Softwood Kraft offers both strength and quick development. The new Penobscot Hardwood Kraft provides strength with high opacity and bulk. We invite correspondence with mills seeking a dependable source of domestic pulp.

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200-pound W.O.G. Ni-resist* Gate Valves—Fig. 2193. Bolted, flanged yoke-bonnet, outside screw rising stem. Accurately guided solid wedge, renewable seat rings. Sizes, 4" through 12".

*Registered Tradename, The International Nickel Company.

200-pound Bronze Globe Valve—Fig. 2608. Union bonnet. Renewable, hardened, wear-resisting stainless steel plug-type disc and seat ring. Sizes, ⅛" through 3". Angle and screwed end valves available.

125-pound Bronze Union Bonnet Gate Valve—Fig. 2700. Inside screw rising stem, accurately guided interchangeable solid or split wedges, integral seats. Sizes, ¼" through 3".

125-pound All Iron Gate Valve—Fig. 1816. Bolted flanged yoke-bonnet, outside screw rising stem. Integral seat regularly supplied, but screwed-in seat rings can be furnished on order. Sizes, 2" through 30".

115th year of manufacturing industrial valves for the free world

POWELL PAPER MILL VALVES

THE WM. POWELL COMPANY CINCINNATI 22, OHIO

Mathieson SQUEEZES your caustic delivery costs

How? Many ways. For example, in most areas, you can order 73% Mathieson caustic soda by truck. The benefits to you are obvious. This concentrated solution means fewer deliveries, less shipping weight, less transportation cost. And only Olin Mathieson offers you this convenient truck delivery.

More ways Mathieson squeezes delivery costs? Location. Mathieson has eight producing plants and shipping points (with a ninth under construction) covering the industrial South and East, with barge, rail or truck shipments to suit your needs. Convenient truck scheduling: we time deliveries when you need them. Service: as you have a right to expect, it's part of company policy, backing every Mathieson chemical with technical assistance. For full details, write OLIN MATHIESON, Baltimore 3, Maryland.

Ammonia • Carbon Dioxide • Caustic Soda • Chlorine • Hydrazine and Derivatives • Hypochlorite Products • Methanol • Muriatic Acid • Nitric Acid • Soda Ash • Sodium Bicarbonate • Sodium Chlorate • Sodium Chlorite Products • Sodium Methylate • Sodium Nitrate • Sulfur (Processed) • Sulfuric Acid • Urea 8947

CHEMICALS DIVISION Olin

felt facts

Recognize these men? They're among the top executives, designers, chemists, and service and sales engineers who plan, edit and contribute to Albany Felt Company's FELT FACTS.

The experience and skills of these men are made available to the paper industry through this eight-times-a-year publication which has won the respect of papermakers everywhere.

Readers tell us they depend upon the authoritative information about paper machine felts detailed in FELT FACTS. This comes from the number of key men who participate in making this publication an informative, accurate, technical reference work. As such, FELT FACTS can and does assist papermakers in producing more tons per day, more days per felt.

Clockwise, by groups from left are: Laurence M. Woodside, Chief Eng., Tech. Field Services, and S. Stuart Engle, Tech. Director. John S. Sweet, Ass't. Chief Chemist; Carl C. Gordon, Chief Chemist, and Z. J. Chagnon, Div. V. President. Thomas O. Tietz, Adv. Mgr.; David F. McConaughy, Ass't. Chief Designer; W. S. Wightman, Ass't. Chief Designer; Harold F. Hedberg, V. President, Research, and James E. Smith, V. President and Gen. Mgr., Albany Felt Co. of Canada, Ltd. Samuel Van Praag, Sales Mgr.; Wayne G. Davis, V. President, Felt Sales, and James Garofalo, Service Eng.

ALBANY FELT COMPANY
ALBANY, N.Y.

AF

Dedicated to Paper Industry Progress

N. Monmouth, Maine Hoosick Falls, N. Y. St. Stephen, S. C.
Cowansville, Quebec Cuautitlan, Mexico

TALK FELT FACTS WITH YOUR ALBANY FELT SALES ENGINEER

Lodding NO SPIT Steam Showers improve sheet quality

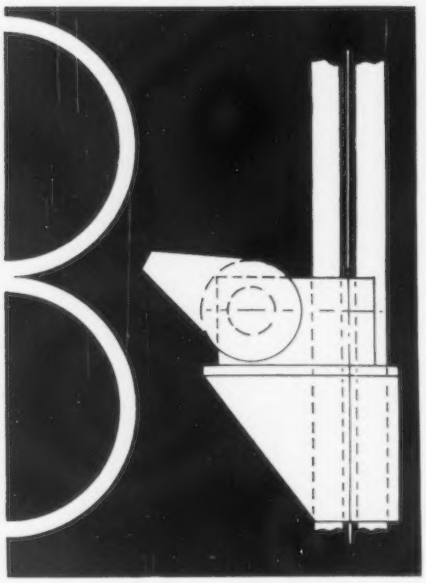
To papermakers who are anxious to improve sheet quality, Lodding *No Spit* Steam Showers are welcome aids. Mounted on super calenders or machine calenders, they distribute an even, controlled amount of dampness to the sheet without any troublesome "moisture drops" or condensation deposits. This leads to improvement in the pressing and finishing processes that make a better sheet.

The efficient pear shape design of Lodding Steam Showers allows positioning close to the nip (doubling as a nip guard) without obstructing the threading of the sheet. Showers can also be mounted farther away without impairing their performance, as steam may be forcefully ejected several feet beyond the aperture, even at pressures as low as 5 to 10 p.s.i. Adjustable bearings allow the showers to pivot out of the way while rolls are being changed.

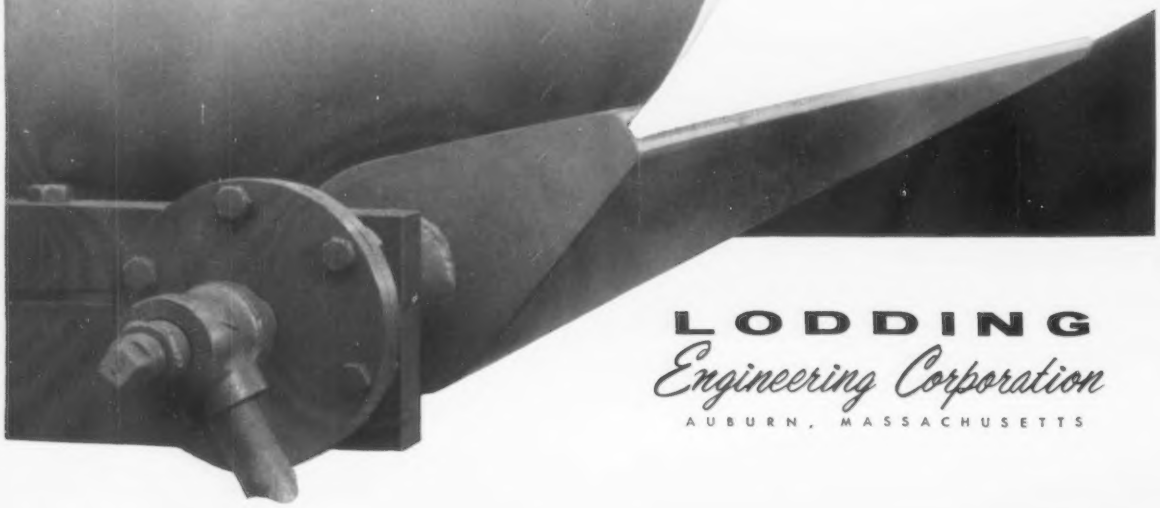
Regulated by valves located at each end of the shower, steam is directed across the full width of the sheet or to either half as required.

Lodding *No Spit* Steam Showers are custom made to any length. They give years of trouble-free service with virtually no maintenance. Installation is simple. No heavy support brackets are required.

For more information get in touch with Lodding or your nearest Lodding sales representative.



Conveniently mounted on calenders for maximum efficiency



LODDING
Engineering Corporation
AUBURN, MASSACHUSETTS

These swatches represent two entirely different titanium dioxide paper coatings.

One is an anatase grade, the other is a rutile grade.

CAN YOU TELL WHICH IS WHICH?

ONE IS THE NEW...

These two swatches of TiO_2 pigment have been applied by silk screen so that you can compare them quickly on this printed page. The formulas are nearly identical except that one contains a rutile grade, the other new *LD-C* anatase.

Although you'll achieve superior coating with regular paper mill machinery, the proof is there . . . new Glidden *LD-C* (on the right) has properties comparable to the rutile. The brightness of anatase is combined with the ease of dispersion and low viscosity features of rutile.

New *LD-C* is equally well suited for on and off machine, size press and calender coating. Compatible with all other common paper coating pigments and adhesives.

Being an anatase grade, new *LD-C* is for coating of all nonwaxing, plain and printed paper and board. And *LD-C* is priced as an anatase. Some users are obtaining savings of up to 2¢ per pound.

Higher machine speeds, heavier coating weights and other advantages are inherent in new *LD-C*. To get the full story, or samples, call your Glidden representative or our Baltimore headquarters.

GLIDDEN ZOPAQUE® LD-C

anatase grade TiO_2 especially developed for paper coating

QUALITY Glidden PRODUCTS

THE GLIDDEN COMPANY

FINEST PIGMENTS FOR INDUSTRY

Chemicals Division • Pigments and Color Department

Baltimore 26, Maryland

MANY GLIDDEN TECHNICAL FACILITIES ARE AT YOUR SERVICE for development or testing work in paper. Write for this new brochure—just off the press—*Paper Research and Development Laboratories.*

HOW BIG SHOULD AN AD SCHEDULE BE?

Open letter to suppliers who serve the paper and pulp industry

Suppliers who advertise in PAPER TRADE JOURNAL sometimes ask us how often their ads should appear. It's a little like being asked, "How high is up?"

Instead of telling advertisers how to schedule their ad dollars we'd like to point out something our editors have learned over the years—that readers want information week in and week out, 52 times a year. They want it enough to pay for it.

It's also a well-established fact that most readers don't care whether information comes from an article or an ad. So, readers want ads just as much as they want news or articles...as long as the ads are informative.

What does this suggest about ad schedules? The people you want to reach are reading PAPER TRADE JOURNAL every week; information about your kind of product is of special interest to some of them every week; to reach the maximum number of actively interested prospects your ads should appear—well, what do you think?

George E. Lockwood PUBLISHER

PAPER TRADE JOURNAL

P.S. Your fellow readers of PAPER TRADE JOURNAL are your customers and prospects.

This pump can give you a price advantage!

The Goulds-Pfaudler glassed pump cuts pump replacement and maintenance costs for many companies making cosmetics, drugs, plastics, paints and other products requiring abrasive or corrosive pumpage. In these industries, where pump life is normally measured in months—or weeks—the Goulds-Pfaudler pump lives on and on.

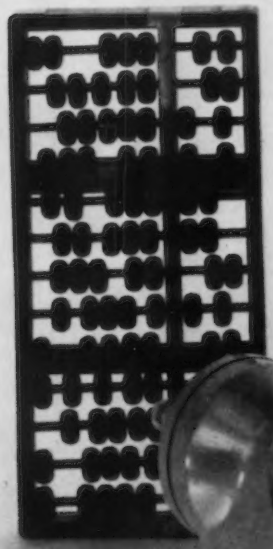
Why? Because it resists corrosion by all acids, except HF, up to 350°F and alkalis at moderate temperatures. Because only severe mechanical impact can damage its glassed surface, and then only locally since the surface will not crack or shatter. Because it withstands quick changes in temperature—up to a 100°F differential under ordinary operating conditions.

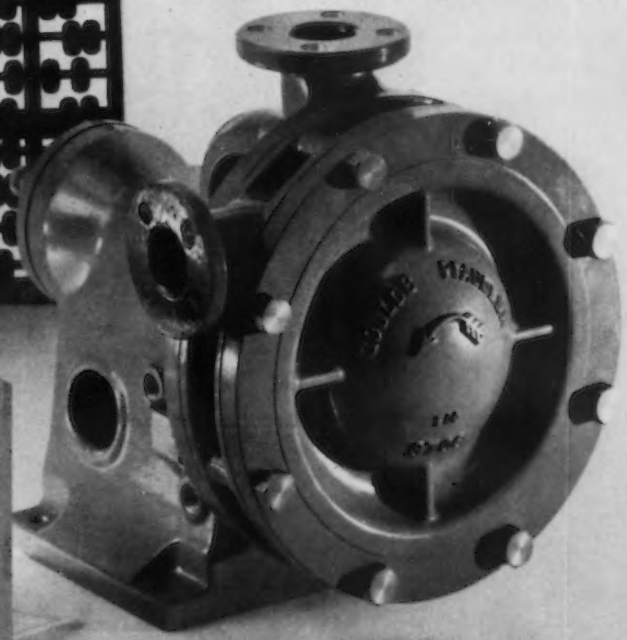
The Goulds-Pfaudler glassed pump also cuts production costs in other ways. It won't, for example, contaminate your product. It exerts no catalytic effect. Products won't stick to it, causing shutdowns for cleaning.

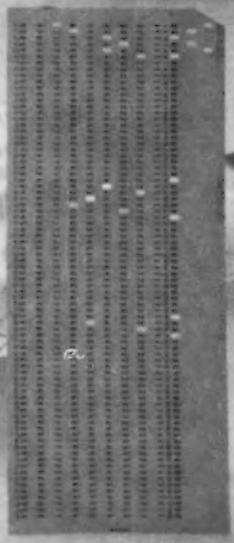
Yes, this pump could be giving your competitors a cost advantage. *But only if it's pumping their slurries and corrosives and not your own.*

For further details, write for Bulletin 725.2. Goulds Pumps, Inc., Dept. C-4, Seneca Falls, N. Y.

GOULDS PUMPS







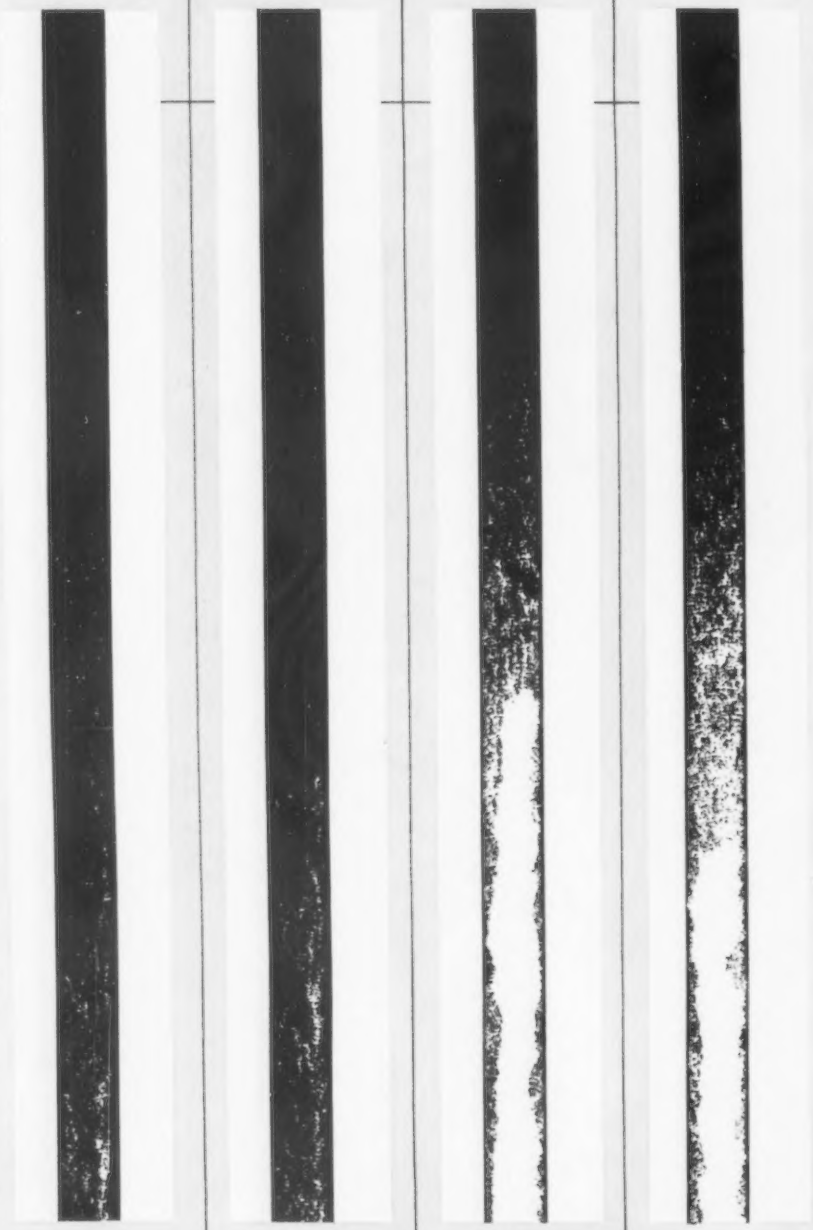
VELOCITY CHART FOR IGT PRINTABILITY TESTER

INK USED IPI NO. 6

SPRING TENSION USED [X] A [ ] B

PRINTING VELOCITY, FT./MIN. AT 35 Kg. PRINTING PRESSURE

A TENSION	B TENSION
	100
100	200
200	300
300	400
400	500
	600



DOW LATEX 630 COATING
Picking Velocity: 290 Ft./Min.

COMPETITIVE LATEX COATING
Picking Velocity: 150 Ft./Min.

PROVEN commercially... greater pick resistance with DOW LATEX 630

The velocity chart, left, for IGT Printability Tester provides proof of the greatly superior pick resistance of new Dow Latex 630. Here, laboratory test data are reported on the relative printability of commercially coated papers.

The two strips on the right coated with a competitive latex represent the performance of the "standard" grade. The two strips on the left represent the performance of that grade with Dow Latex 630 replacing the competitive latex in the coating.

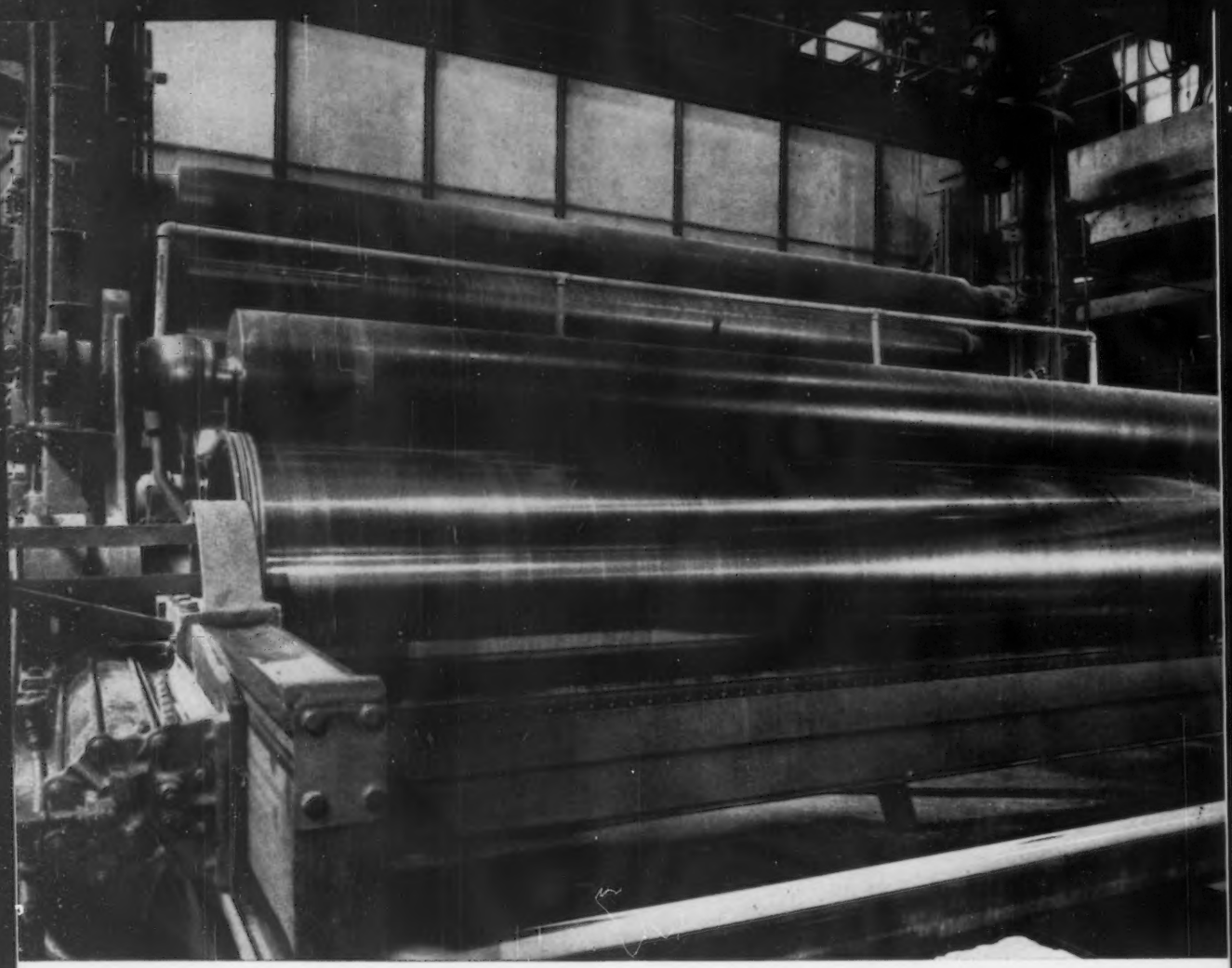
In this test, Number 6 ink was used, and "A" spring tension. The test strips show that average pick velocity of strips with the competitive latex coating was 150 ft. per minute. But strips coated with Dow Latex 630 showed an average pick velocity of 290 ft. per minute . . . also note the reduction in bodystock splitting and the "blacker" black of the ink with the Dow Latex 630 coating.

In addition to greater pick resistance, Dow Latex 630 offers exceptional starch compatibility, excellent mechanical stability, and other outstanding advantages. Together, they spell superior printability . . . paper that permits clear, sharp, true-to-life reproduction with a minimum of problems for the pressman. Type reproduction stands out sharp and clear, too, because coatings made with Dow Latex 630 produce a more uniformly smooth printing surface.

Find out how Dow Latex 630 can help you to produce better paper . . . and boost your sales. For detailed information, write today to THE DOW CHEMICAL COMPANY, Midland, Michigan, Coatings Sales Department 1931DP6-5

Write for a free copy of this informative booklet on new Dow Latex 630. It contains valuable data and information on how you can improve the performance of your coated papers.

THE DOW CHEMICAL COMPANY DOW Midland, Michigan



Unscheduled downtime can cost the average paper mill up to $4,000 an hour—or $60 a minute.

How to turn a $60-a-minute loss into an 8.8% profit

The answer? Install a Texaco "Stop Loss" Program. It can keep your machines and equipment properly lubricated at all times. As a result, they run better. Bearings and other parts last longer. Your paper machine runs at top capacity—with minimum production losses.

Other "Stop Loss" benefits include: reduced lubricant inventories, and purchasing costs. All told, this Program can cut your overall maintenance costs as much as 10%. These savings, in turn, can increase your net profits as much as 8.8%.*

How a "Stop Loss" Program works. Basically, a "Stop Loss" Program is concerned with modernizing and controlling lubrication practices—from purchasing right through actual application.

Professional Texaco lubrication engineers help specify the right lubricant and lubrication interval for every piece of equipment—from woodyard to machine shop. Particular attention is given to such paper mill problems as wet and dry end lubrication and water contamination. Lubrication responsibility is delegated . . . a fool-proof system of lubrication control is set up.

For full details on how a "Stop Loss" Program can fit into your operation and earn dividends for you, write:

Texaco Inc., 135 East 42nd St., N. Y. 17, N. Y. Dept. PT-41

*The U. S. Department of Commerce estimates that a paper mill doing a $10,000,000 yearly business will spend about $650,000 for maintenance. A 10% reduction in maintenance costs would amount to $65,000. Assume that profits average 7.34%—or $734,000. By adding the 10% maintenance saving, profits now total $799,000 . . . an 8.8% increase.

Tune In: Texaco Huntley-Brinkley Report, Mon. Through Fri.-NBC-TV

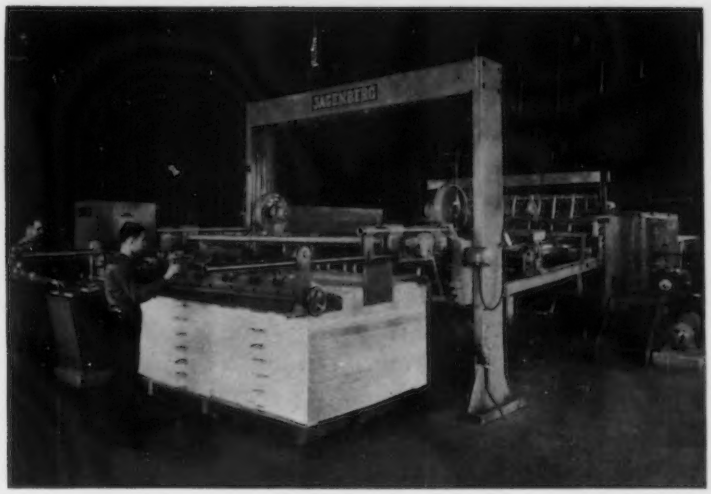
TEXACO

Throughout the United States

Canada • Latin America • West Africa

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

JAGENBERG

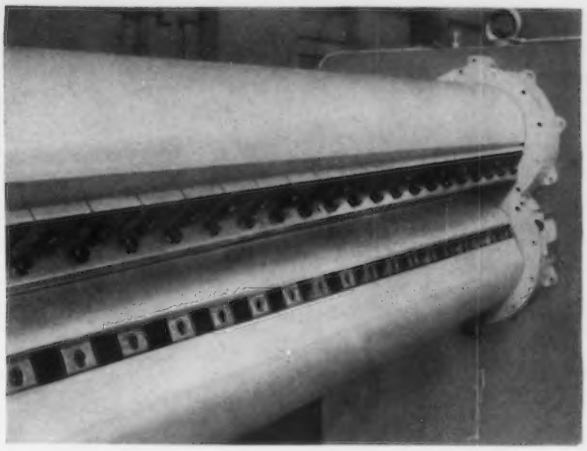


Left: JAGENBERG "SYNCHRO-FLY" Cutter with mounting overlapping layboy at West Virginia Pulp & Paper Co., Covington, Virginia.

Below: The "heart" of the "SYNCHRO-FLY". A pair of rotary cut-off knives which will travei at the web's own speed during the actual cutting phase, irrespective of sheet length and web speed.

SYNCHRO-FLY® SHEET CUTTER

THE ONLY CUTTER THAT SHEARS THE WEB INSTEAD OF CHOPPING IT



IF you desire a cutter with unusually high knife capacity,
or IF you wish a really clean, cliff-like cut-off at any thickness or cutter speed,
or IF you want to eliminate fuzz and dust at the knife cut,
or IF you are interested in drastically reducing the frequency of knife changes,
or IF you can appreciate automatic sheet squaring...

the "SYNCHRO-FLY" may be the right answer for you.

Available as Simplex for paper, pulp or board or as Duplex for pulp or board only. Can operate from rolls or in-line with board machine, pulp dryer or laminator.

JAGENBERG WERKE • Düsseldorf • Germany

Sales and Service: JAGENBERG USA, INC.

300 Park Avenue South, New York 10, N. Y.

In Canada: JAGENBERG OF CANADA LTD., 209 Davenport Road, Toronto 5, Ont.

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Twenty-seven valued articles all together . . . each written by an authority . . . offering solutions to various problems faced by the Industry's Orphan —FINISHING . . . comprising the initial phases of PAPER TRADE JOURNAL's exclusive "Operation Finishing." Order your personal copy TODAY! Price, only . . . $2.50 per copy

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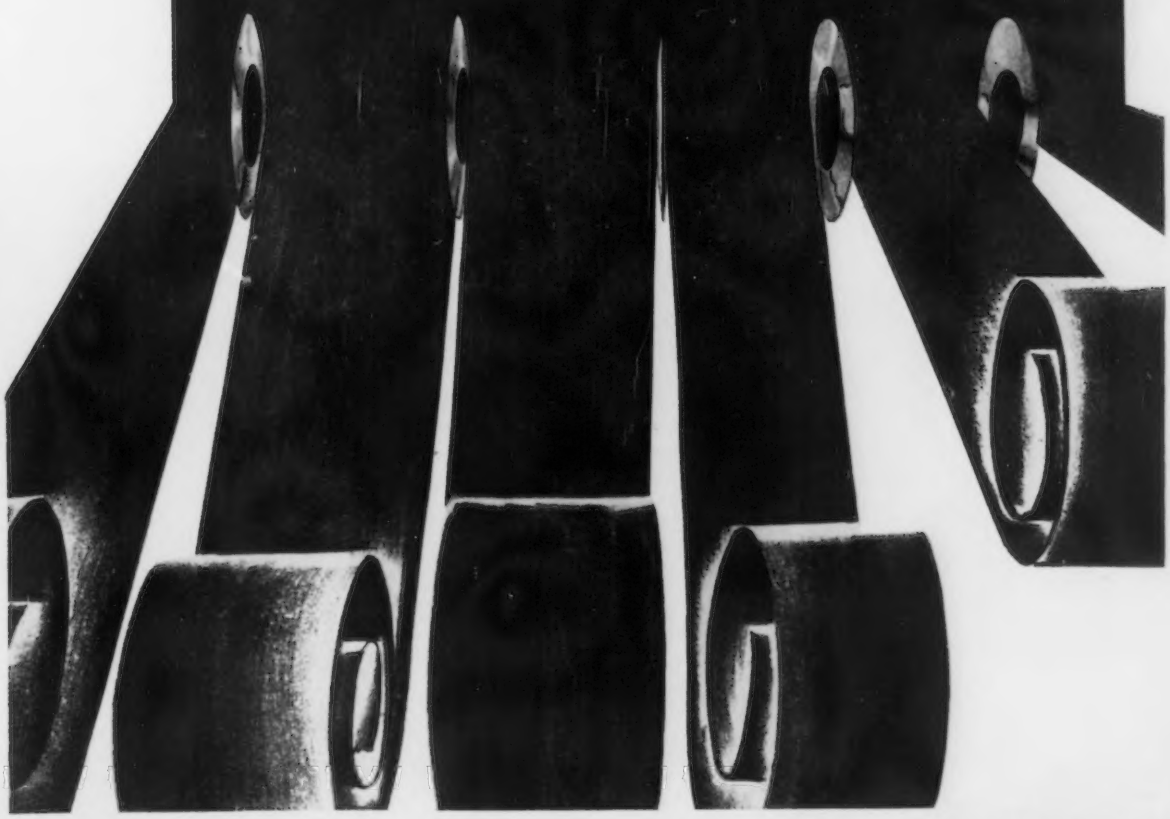
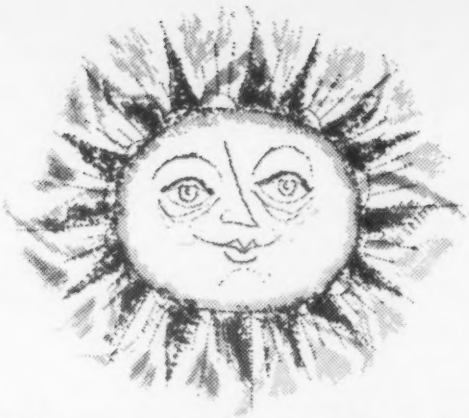
kidder

In the new Kidder Shear Cut Center Wind Slitter, Type CWN, all the features you need for efficient high speed performance are BUILT IN as original equipment . . . That's why a KIDDER TYPE CWN SLITTER will cut your costs on every pound of product you slit...And you're Profit Protected by Kidder Performance Engineers . . . For details contact Kidder Press Company, Inc.



Even old Sol



envies

Rice Barton Dryer Sections

The most efficient drying systems under the sun are another Rice Barton contribution to papermaking progress. Once considered neglected and costly, today drying capacity can be stepped up substantially by improved location and spacing of dryers and the proper combination of steam and air units.

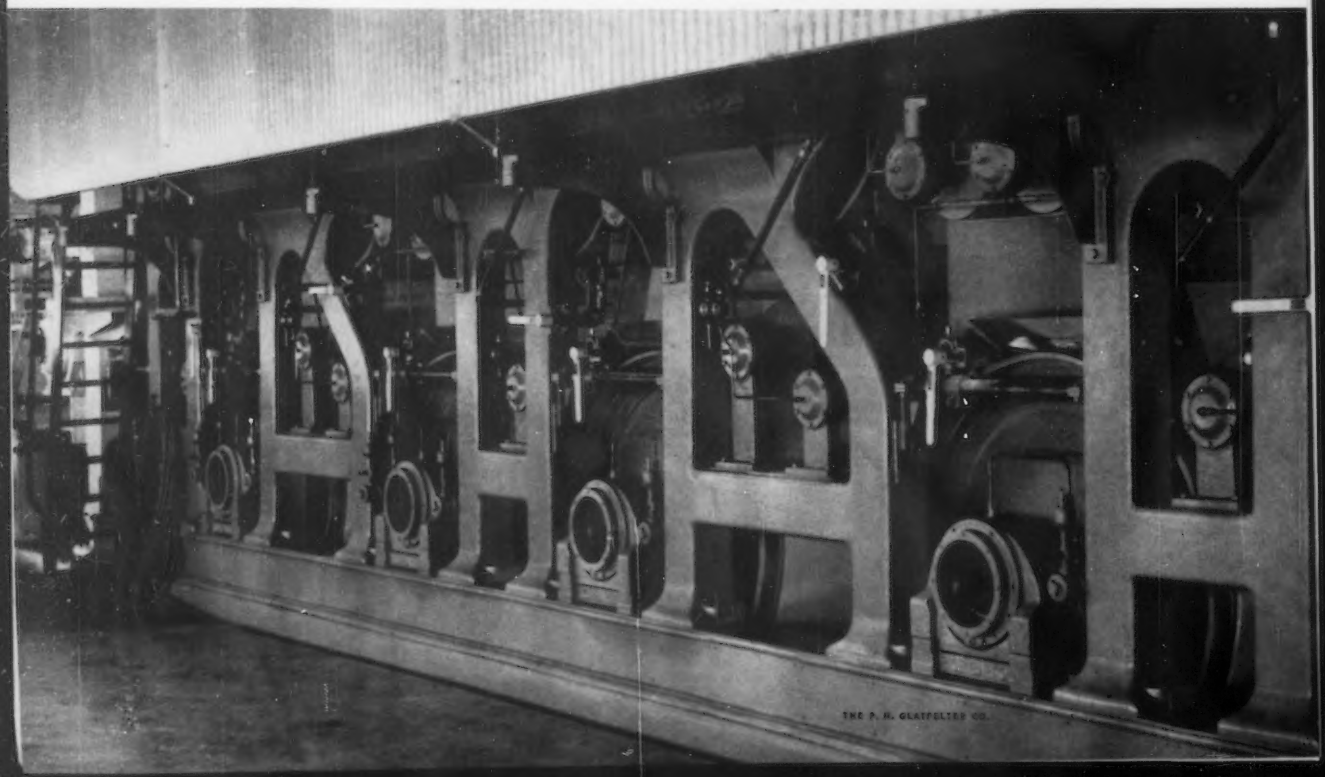
Furthermore, thermal efficiency can be increased and dryer sections shortened on both new installations and modernization of old.

Experience gathered since 1837 has made Rice Barton dryer experts, particularly leading the industry in perfecting Air Drying. Let us explain the flexibility and economy with which you can increase your capacity. Write for latest information.

RICE BARTON

Rice Barton CORPORATION • WORCESTER, MASS.

FOURDRINIERS, PRESS SECTIONS, DRYER SECTIONS, CALENDERS AND SUPERCALENDERS, REELS, WINDERS, HEAD BOXES, SIZE PRESSES, BREAKER STACKS, DIFFERENTIAL DRAW CONTROL DRIVES AND CONE PULLEY DRIVES, PULPING EQUIPMENT, HIGH VELOCITY AIR DRYERS, TRAILING BLADE COATERS, FIBRE-FLASH DRYING SYSTEMS



PAPER TRADE JOURNAL

WEEK OF JUNE 5, 1961

SEALRIGHT-OSWEGO FALLS CORP. celebrates 75th anniversary of its founding at home plant and offices in Fulton, N. Y. At the speakers dais at a luncheon held to commemorate the diamond anniversary are, from left: F. C. Ash, chairman of the board, Sealright-Oswego; Keith S. McHugh, commissioner of the Department of Commerce, State of New York; R. Reid McNamara, vice president, Sealright-Oswego, and president of Sealright Co., Inc.; H. C. Estabrook, president, and C. M. Tooke, executive vice president, Sealright-Oswego. The company was founded in 1886 at Fulton as the Oswego Falls Pulp and Paper Co. Today, Sealright has plants in Kansas City, Kans., Los Angeles, Calif., and Peterborough, Ontario, Can.

Menasha Brings New Corrugating Mill into Production

Menasha Wooden Ware Corp. has just begun production at its new $6½ million plant near North Bend, Ore. Utilizing local hardwoods and waste Douglas fir from the company's plywood mill, pulp is produced by the NSSC process and manufactured into corrugating medium on a 162 inch trim fourdrinier. Capacity is 125 tons per day.

The corrugating medium produced at this plant will be shipped to Menasha's box plant in Anaheim, Calif.

Location of a pulp and paper mill in this area was made possible by the discovery of a vast supply of water beneath sand dunes adjacent to the ocean. The search, experimentation and testing of the water supply was carried out by Pacific Power and Light Co.

The company's home plant which manufactures corrugated and solid fiber boxes is in Menasha, Wis.

Proposed B.C. Pulp Mill Reported Nearer

With the taking over of some of the saw mills and plants of National Forest Products, Ltd., in B.C. by Noranda Mines, Ltd., the way is said to be opening for the long proposed establishment of a pulp mill in the central B. C. area near Prince George.

Waite Amulet Mines, Ltd., a subsidiary of Noranda Mines, Ltd., has now taken over all the outstanding common shares of two sawmill and logging companies from National Forest Products, Ltd.

The agreement gives Noranda the rights to an application for a plywood harvesting license in the Prince George area which has been filed by National Forest Products. Legislation was passed earlier this year by the B. C. Legislature setting up machinery for issuance of this type of license, which it is stated, was initiated by suggestions of NFP.

If the pulp mill plans are pushed through it is understood a $50 million mill with capacity of 300 to 500 tons of bleached kraft pulp daily would be erected. The B. C. Government has made known for some time that in view of the forest wasteage in the Prince George area it is most anxious to establish a pulp mill there.

Mervin Davis, president of NFP, said that Noranda had made no definite commitment about a pulp mill but admitted it was the object of the whole deal. Noranda spokesmen told the press in British Columbia that engineering studies for a pulp mill would be started as soon as possible.

Paper and Paperboard Production

The American Paper and Pulp Association reported the ratio of the United States paper production to mill capacity for the week ending May 20, 1961, at 92.5 per cent, compared with 91.6 per cent, revised, for the preceding week. The ratio was 97.8 per cent for the corresponding week a year ago.

The National Paperboard Association reported the paperboard production ratio for the week ending May 20, 1961, at 93 per cent, compared with 92 per cent for the preceding week and 95 per cent for the corresponding week a year ago.

(Detailed Statistics on page 52)

SOME OF THOSE attending a recent seminar on "Condensate Behavior in Paper Machines," held jointly by the Johnson Corp. and the St. Regis Paper Co. in Pensacola, Fla., were: Back row, standing, D. G. Burkhard, Dominion Engineering Co.; J. Blue and J. Campbell, Minneapolis-Honeywell; C. S. Anderson and A. Zanod, St. Regis. Front row, D. Hannasch (seated), Minneapolis-Honeywell; G. Krekorian (kneeling), Rice Barton; R. O. Monroe, Johnson, and H. McIntyre, St. Regis. Picture was taken at demonstration of a test drier roll, set up at the St. Regis mill to simulate all conditions affecting drier roll operation and drainage. Two seminars have been held, to present the findings of a mutual research project undertaken by Johnson and St. Regis, assisted by Minneapolis-Honeywell Regulator Co.

Kokusaku Pulp Industry Making Clupak in Japan

At its Asahigawa paper mill, the Kokusaku Pulp Industry Co., Ltd., of Tokyo has begun production of Clupak extensible paper. The president of Clupak, Inc., G. E. Amerman, said that this is the third licensee in Japan to begin making the extensible paper in the past month.

The extensible unit is installed on Kokusaku's new No. 1 machine with a wire width of 250 CM (98 inches). Both the No. 1 machine and the extensible papermaking unit were built by Mitsubishi Heavy Industries, Reorganized, Ltd.

Denver Bag Firm To Occupy New Plant

Paper and Plastic Converters, Inc., formerly known as American Paper Products Co. has occupied a new 17,500-square-foot plant in Denver, Colo.

One of the functions at the new plant will be converting of raw paper stock into teletype rolls, adding machine and perforated tapes. All types of paper and polyethylene bags will be produced by the new machinery.

The firm has operated in the Denver area for the past eight years.

Nat'l. Starch and Chemical Purchases Kleen-Stik

Donald Pascal, president, National Starch and Chemical Corp., and Gerald Cole, president, Kleen-Stik Products, Inc., have jointly announced the purchase of the business and assets of Kleen-Stik by National Starch and Chemical. Kleen-Stik will operate as a subsidiary corporation, and the present management will continue to direct all operations of the new company.

Kleen-Stik produces pressure sensitive labelling papers, foils and films which are sold to printers for conversion into labels and point-of-purchase materials used in the packaging and merchandising fields.

Gaspesia Sulphite Makes Changes in Company Name

Gaspesia Sulphite Co., Ltd., has changed its name to Gaspesia Pulp and Paper Co., Ltd. The company maintains offices at 2055 Peel Street, Montreal 2, P. Q., 9555 St. Louis Road, Quebec 6, P. Q., and Chandler, P. Q.

New Vice Presidents for Columbia River Paper

At a recent meeting of Columbia River Paper Co., the board of directors elected Robert H. Noyes, Jr., and Cecil Taylor as vice presidents of the company.

Mr. Noyes started with the company in 1938 in the sales department. In 1947 he was promoted to sales manager, the position he still holds in addition to his vice presidency.

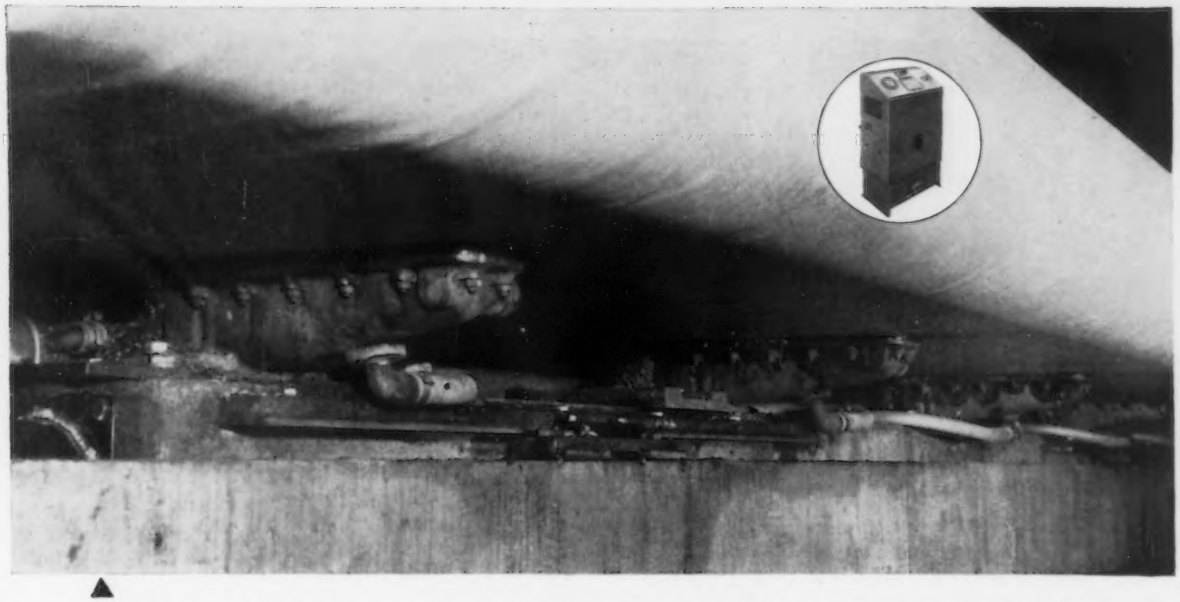
Mr. Taylor started with the company in October 1953 as general superintendent of the company's Vancouver Division and was later promoted to general manager of manufacturing, which position he still holds with the title of vice president.

"Too much showthrough. Send it back to the beaters."

WIDE NARROW *FAST RUNNING* S-L-O-W

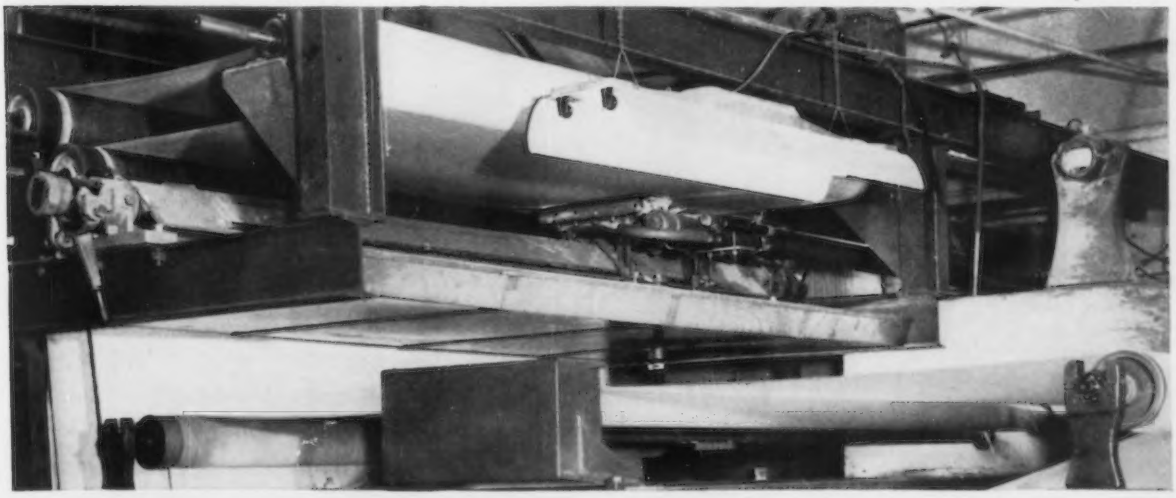
Your Felts Do More And Better Work At Lower Cost When

VICKERY CONDITIONED



▲ This five-shoe Vickery Felt Conditioner is keeping one of the felts on a 234-inch, high speed board machine continuously clean and open. Inset pictures the control console that regulates the speed of the hydraulically driven Conditioner to match the speed of the felt.

This single-shoe Vickery Felt Conditioner is doing equally fine work on the second press of an 81-inch Fourdrinier making top quality writing specialties. It eliminates expensive shutdowns that used to occur two or three times a week. It keeps the felt uniformly clean and absorbent and it has succeeded in doubling felt life. ▼



BIRD MACHINE COMPANY

SOUTH WALPOLE, MASS.

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Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND COMPANY, Limited, Montreal

PAPER PEOPLE

A. G. Scherer

B. W. Elliott

Penobscot Appoints Pulp Sales Representative

Penobscot Chemical Fibre Co. announces the appointment of A. George Scherer as a pulp sales representative. He will work directly with William D. Duryea, assistant vice president in charge of sales.

Mr. Scherer was graduated from Yale University in 1956 and attended N.Y.U. Graduate School of Business Administration. Prior experience in the paper industry was obtained from Great Northern Paper Co. where he was a salesman from 1956 to March 1961 when he joined Penobscot.

Wis. Information Service Elects Chairmen

Samuel A. Casey, executive vice president and treasurer of Nekoosa-Edwards Paper Co., Port Edwards, Wis., has been elected general chairman of the Wisconsin Paper Industry Information Service. He succeeds M. J. Schulenburg of Kimberly-Clark Corp. The Information Service is an association of major Wisconsin pulp and paper manufacturers.

Elected vice chairmen were D. J. Dughie, vice president and general manager, Wisconsin mills, Scott Paper Co., Marinette, and John Reeve, executive vice president, Appleton Coated Paper Co., Appleton, Wis.

Donald Lichty of Nekoosa-Edwards Paper Co., Port Edwards, was named treasurer, and T. E. Branagan, Appleton, was re-elected manager.

Elliott Joins Wausau As Atlanta Sales Rep.

Ben W. Elliott has been appointed Atlanta district sales representative for Wausau Paper Mills Co., at Brokaw, Wis.

Prior to joining Wausau's sales staff, Mr. Elliott spent nearly 30 years, actively and successfully engaged in selling fine papers for several southern paper distributors.

P. A. West

Scott Fills New Post In H&W Organization

Phillip A. West has been named to the newly created post of manager of printing paper sales, Eastern Division, in Scott Paper Co.'s Hollingsworth & Whitney organization.

Mr. West brings to the H&W division an extensive background in sales management. He was graduated in 1953 from the University of Pennsylvania Wharton School.

Kennebec River Announces Management Changes

Management changes at the Kennebec River Pulp and Paper Co., Inc., have been announced.

Philip R. Lyons has been made treasurer and business manager, Joseph F. Gill, manager of production. Both men have been affiliated with the company since Economy Corp. purchased the local mill from Great Northern in July 1955. Mr. Lyons has been serving as treasurer since Kennebec assumed ownership, Mr. Gill as assistant mill manager.

George Rogers is general superintendent in charge of all product production, John Zebiak the assistant general superintendent.

Lothroy B. Bartlett resigned recently as manager of the plant, a position he held for six years under the present management and formerly with Great Northern.

CCA Announces Personnel Changes

Fred Frantz, plant manager at the Container Corp. of America, has announced some personnel changes, at its mill in Wilmington, Del.

Albert F. Gray, formerly assistant superintendent, is now superintendent. Clarence P. Montgomery, former superintendent, has retired. Earl Jamison is supervisor of maintenance and boiler room departments.

L. A. Cox

Personal Products Chooses New Board Member

Personal Products Corp. has named Lionel A. Cox vice president of research and development engineering and a member of the board of directors. Personal Products, an affiliated company of Johnson & Johnson, manufactures sanitary protection products for women.

Dr. Cox joined Personal Products in March of 1961 after serving for

over seven years as director of research for Johnson & Johnson, Ltd., Canada. His background includes wide experience as an industrial research chemist and a teacher of chemistry.

L. R. Scott

Allied Names Purchasing Director

Allied Paper Corp., Kalamazoo, Mich., has promoted L. R. Scott to the position of director of purchasing. The new director of purchasing replaces Charles Yonker who retired June 1 following the completion of over 41 years of continuous employment with the corporation.

An employe of Allied Paper since 1938, Mr. Scott previously held the positions of paper tester and laboratory technician at the King Mill Division and quality control and technical supervisor at the Bardeen Mill Division. In 1956, he was named purchasing supervisor, waste paper, for all mill divisions of the company.

Sonoco Makes Changes In Sales Organization

A series of changes in the sales organization of Sonoco Products Co. was recently announced.

L. H. Stokes was named to the newly created position of general field sales manager. He joined the company in 1925.

C. H. Campbell, Jr., was named assistant general field sales manager. He joined the company in 1948 in the sales department. In 1958 he became resident sales manager at the company's Atlanta plant.

Robert Blackwell was named divisional sales manager and will continue to assist Mr. Stokes in the sale of paperboard and cores.

J. A. Gainey, who was transferred from the California plant to Atlanta in 1960, has been named to succeed Mr. Campbell as resident sales manager. R. E. Tuck will serve as assistant resident sales manager.

Walseth Advances At Weyerhaeuser

Curtis S. Walseth has been appointed associate research director of Weyerhaeuser Co.'s Pulp and Paperboard Division.

Mr. Walseth has been technical director of the company's Grays Harbor, Wash., branch since 1956. He served earlier as a group leader in the pulp division research department at Longview, Wash.

H. G. Nendorf

Rex Paper Realigns Mill Management Personnel

The Rex Paper Co. has changed the makeup of its mill management to reflect more properly the requirements of present day papermill operations.

Effective immediately, M. H. Davidsmeyer, formerly superintendent of the Rex finishing department, will be superintendent of operations, including the responsibility for labor relations and plant personnel management.

James E. Kline, who has been associated with Rex for the the past five years in coating and quality control, will be in charge of all of the company's technical applications and quality control, effective June 1. Research and product development will also be Mr. Kline's responsibility.

The company has engaged Robert Slevatz, who is new to the paper industry, as assistant to Mr. Kline.

Henry G. Nendorf, Rex general superintendent, is retiring effective June 30. He will, however, remain active as a consultant both to the manufacturing and technical divisions of the company. He has been with Rex Paper since April of 1923, coming to Rex from Allied Paper.

Mr. Nendorf has served with Rex as foreman in the coating mill, superintendent of the coating mill, assistant general superintendent, and for the past several years has been general superintendent.

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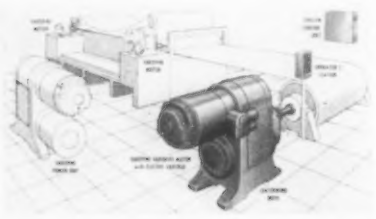
NEW EQUIPMENT & SUPPLIES

Centerwind Drive System Maintains Rewind Tension

Designed as an automatic tension rewind, a Centerwind Drive has been introduced by U. S. Electrical Motors



Inc., as part of their Varidyne a.c. frequency-controlled Range Drive System. The centerwind is automatically synchronized with the line speed, thus coordinating linear winding speed and line speed of the range.

The centerwind drive eliminates the need for touching the material with dancers or other mechanical tension-sensing devices. The operator may set the tension at any desired level, for constant or tapered tension winding. The centerwind drive keeps the tension within the strength limitations of the web. This system is said to also minimize the possibility of damage to the edges of the rolled material.

On a restart during the winding operation, the U. S. Centerwind Varidyne a.c. system automatically starts at the exact speed of the original stop. Thus, according to U. S. Motors engineers, there is no re-calibration or hunting for the correct speed. Several types of U. S. Varidyne Centerwind Drive Systems are being offered. They include:

Varidrive type: An automatic control system providing exact constant or taper tension control in the centerwind drive. The system can be provided with stall tension whenever the application requires it.

Torque motor: Used where very low tension with a fixed taper is required. The amount of tension is manually adjusted by the operator.

Mechanical clutch: The Centerwind Drive is equipped with manual or automatic control, for constant or taper tension, by using a web tension transmitter (pneumatic type). This system is used where very high build-up ratios are required. U. S. Electrical Motors Inc., P. O. Box 2058 Terminal Annex, Los Angeles 54, Calif.

Commercial Availability of Butyl Latex Announced

Commercial availability of butyl rubber in latex form has been announced by Enjay Chemical Co. Designated Enjay Butyl latex 80-21, the material is a chemically stable emulsion of butyl rubber in water, containing approximately 55 per cent solids.

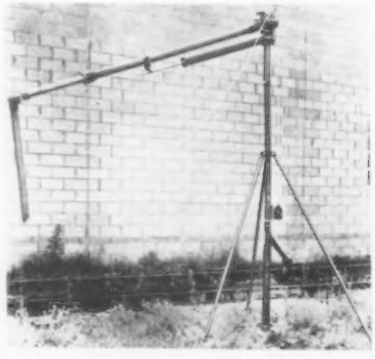
Enjay Butyl latex 80-21 is available in insulated 8000- and 10,000-gallon tankcars lined with a phenolic coating; and in 55-gal, open-head, lined steel drums.

Enjay Butyl latex 80-21 can be compounded with pigments, fillers, thickeners and tackifiers. It is compatible with a wide range of resin and elastomer emulsions. Vulcanizates possessing the outstanding environmental resistance and the low permeability to moisture and gases characteristic of butyl rubber can be prepared by curing 80-21 with sulphur, zinc oxide and other ultra-accelerators.

According to Enjay, the low permeability of butyl films to water vapor, air and other gases suggests 80-21's use in air-barrier and food-wrapping papers, among other uses.

Some characteristic physical properties of Enjay Butyl latex 80-21 are:

Color—White; Total Solids, wt.%—54-55; Specific Gravity at 70°F.—0.96; Density, lbs./gallon—8.1; pH—5-6; Particle size, microns, Average—0.5; Range of 95%—0.05-1.0; Surface tension at 70°F., dynes/cm—30-38. Enjay Chemical Co., 15 West 51st Street, New York 19, N. Y.



PORTABLE LIQUID LOADER can be set up anywhere in minutes to load and unload bulk liquids. The 2-inch bronze and aluminum K-59 loader is small, light weight (only 198 pounds), and complete in itself since it provides its own support. OPW-Jordan, 6013 Wiehe Road, Cincinnati 13, O.

Belt Fasteners for Small Pulley Drives

Two Talcott belt fasteners, especially engineered for operating on machines with small pulley drives,

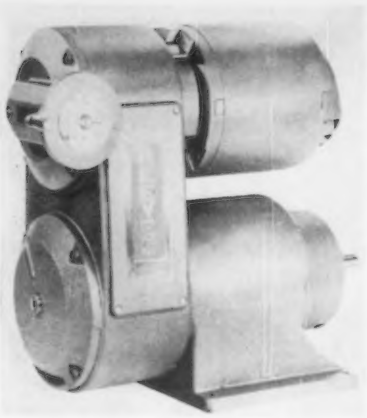
have been introduced by Peerless Hardware Mfg. Co.

Developed in cooperation with one of their customers, these malleable iron fasteners have teeth designed for quick shortening of belts. No special tools are required for the installation of these fasteners which, it is said, lock securely and run smoothly on pulleys 2 to 4 inches in diameter. Designated as No. 131 and 134, these new Talcott belt fasteners by Peerless are for 1 and 1¾ inch wide light double leather belts. Peerless Hardware Mfg. Co., 1285 Manheim Pike, Lancaster, Pa.

Variable Speed Drive in 25-40 H.P. Ratings

Reeve's motorized variable speed drive, size 600 Motodrive, complete with single, double or triple stage gearing, provides speed ratios up to 4:1 and output speeds from 2630 to 25 r.p.m. in 25 through 40 h.p. ratings.

Vertical, horizontal and 45° assemblies are available in wall or ceiling mountings at no extra charge. In addition, trunnion mounted vertical, horizontal 45° assemblies are offered as standard in no reducer and single reducer units. Either "C" flow or "Z" flow output shaft arrangement is standard for all assemblies. "Scoop" mountings to meet J.I.C. standards



and NEMA "D" output flange mountings are also available.

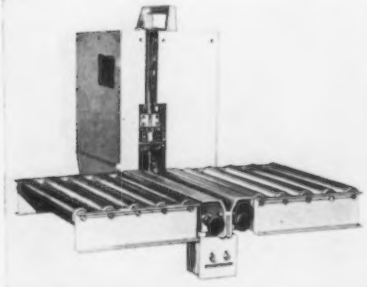
Magnetic brakes up to 230 ft. lbs. capacity are available on the size 600 motodrive unit. Adjusting rails are provided for unit ratings ¼ through 40 h.p. Electric remote control is available for all ratings, as is the Airtrol and all extended indicator handwheel controls. Reliance Electric & Engineering Co., 27401 Euclid Ave., Cleveland 17 Ohio.

Ink for Corrugated Kraft Dries in Four Minutes

An ink that sets in 45 seconds and dries in four minutes without steam, water or heat, was recently introduced by Interchemical Corporation's Printing Ink Division, 67 West 44th St., New York 36, N. Y. Specially developed for printing on corrugated and multiwall kraft, the ink is marketed under the trade name of Poly-set. According to the manufacturer, the ink also features good finish and rub resistance, sharp printing, smooth lay and good press stability.

The ink dries by means of a rapid interaction between the cellulose fibers of the substrate and the vehicle system in the ink. An independent test has shown that the ink sets within 40 seconds and will pass a 50-cycle, four pound Sutherland Rub Test in five minutes. The principal advantage of this fast-drying system is that it enables the corrugated container producer to go directly from the printer-slotter into finishing equipment, including folding operations, without being concerned about streaking or damaging printed areas. Time and space is not wasted by storing containers for a 24-hour ink drying period. A midwest plant, reports that the ink went from unprinted sheets, through the printer-slotter at 16,000 impressions per hour, through automatic folder-tapers, and into shipment in only 35 minutes schedule. Although press stability is good, a specially formulated wetting agent offers considerable ease of printer-slotter workability. According to IPI, tests have shown that the ink can be allowed to stand, with rollers out of contact, for a 48-hour period and then brought back to workability within five minutes after the rewetting agent is added.

LAGGING A PULLEY without removing it from the conveyor can be accomplished by using fire-resistant cured sheet and cold bonding. No machinery or special skill is required. No bolts or screws are used, which eliminates danger to the conveyor belts and allows the lagging to be worn completely through. Kits are available for any size pulley. General Splice Corp., 32 Woodworth Ave., Yonkers, N. Y.



STEEL STRAPPING MACHINES, Model F7, incorporating a basic strapping mechanism described as the most compact, low-cost developed to date is completely air-powered and electrically controlled. Dimensions of the strapping mechanism are 26 x 14 x 12 inches. The F7 machines can include the basic strapping mechanism mounted in top or side positions, fully package-circling tracks and controls for fully automatic strapping. Acme Steel Co., 135th Street, Chicago 27, Ill.

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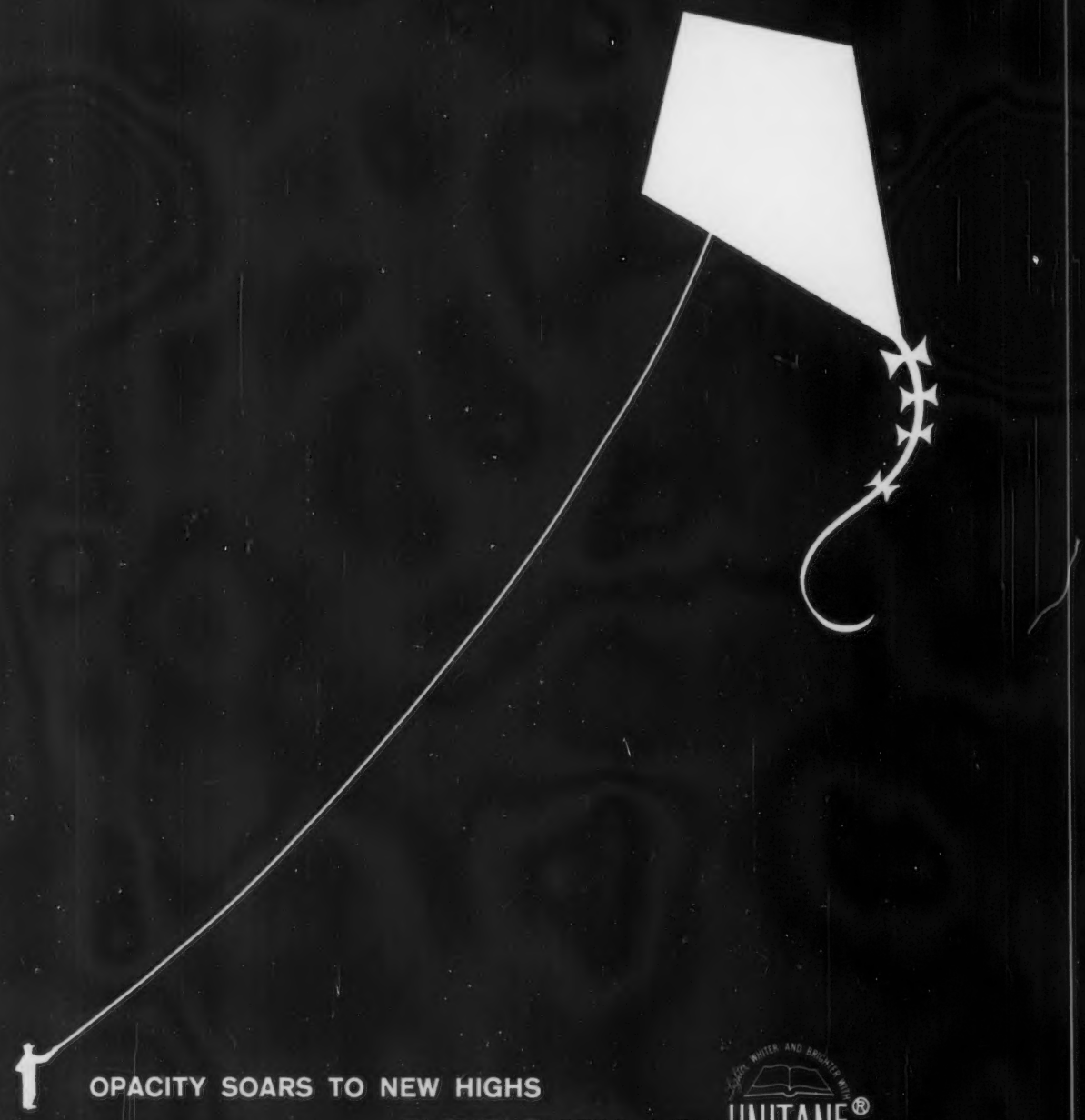

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DIRECTOR OF RESEARCH Jerry Karr (left, below) and Orman Curtis, materials handling engineer, review an experimental setup of cutters and slitters before equipment goes to customer's plant. Research tryouts enable mill operators to see specified equipment actually running before it is built for production. Research group works closely with mill customers.

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ELECTRONIC equipment is checked by Karr and Curtis for possible application to Beloit Eastern's finishing and converting product line.

PHOTOS: S. R. CHRISTENSEN

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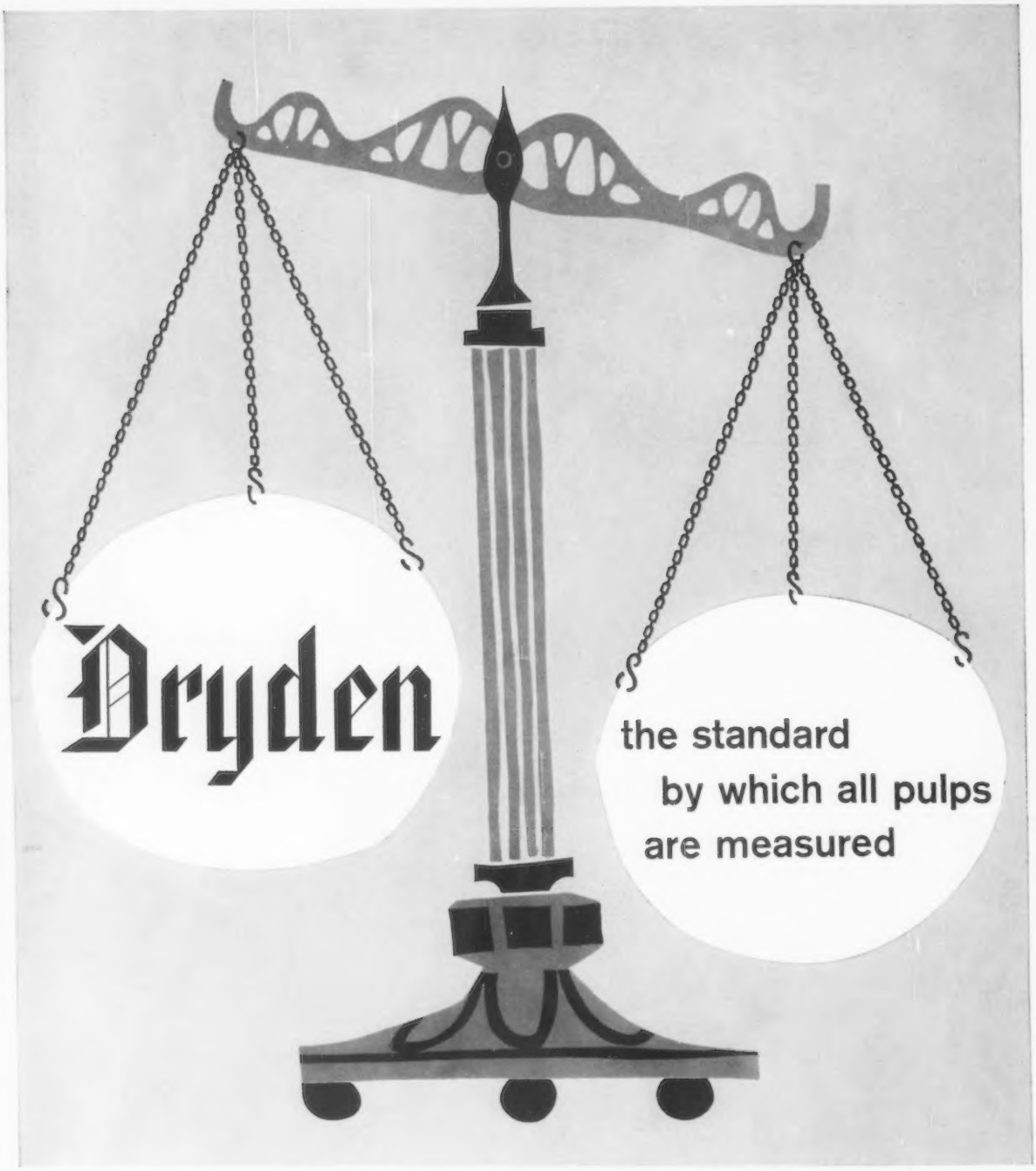

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Stainless Steel Fourdrinier Wires Now in Regular Operation

Packaging Corp. of America has been experimenting with all stainless steel paper machine wires since 1957. The author reports that with the solution to seaming problems these new wires have proven very advantageous for them.

John L. Ham,
Paper Mill Supt., Corr. Medium,
Filer City Mill,
Packaging Corp. of America

The Filer City, Mich. mill of Packaging Corp. of America has been engaged in the manufacture of .009 NSSC corrugating medium since 1949 when we changed over from kraft specialties. After the change to NSSC, wire life proved disappointing, with wires falling off the machine in as little as three days. With the initiation of drum washing of the pulp, this problem was alleviated and wire life of 20 to 30 days was common up until 1953. At this time, a second paper machine and additional pulping facilities were installed. The pH was lower and wire life dropped to ten and twelve days on brass-bronze wires.

Problem Alleviated

During the period of 1954 to 1957, several types of wires were tried. These included nickel-plated wires, tin-plated wires, all-bronze wires, and wires with plated warps and plastic coated shutes.

These wires performed satisfactorily and wire life averaged about 20 days on number one machine and 17 days on number two machine. Number one has an 80-foot x 162-inch wire and runs approximately 750 f.p.m.; number two has a 110-foot x 174-inch wire and runs approximately 1000 f.p.m.

In 1957, a bleached kraft machine and pulp mill were started up, and the economics of the new installation required a change in the NSSC cooking liquor manufacture.

Life Falls off Again

Following this change, no wire gave outstanding results on the paper machines. The new liquor was extremely corrosive, and both plated and unplated wires failed in six to twelve days.

Some of the characteristics of wire failures for the various types of wires were:

1. The shute strands of unplated brass-bronze wires corroded very quickly.

2. On plated wires, a flaw in the plating on any shute strand would open that strand to concentrated corrosive attack. Whole shutes would disappear in a matter of days, and the warps, having no support in that area, would crack.

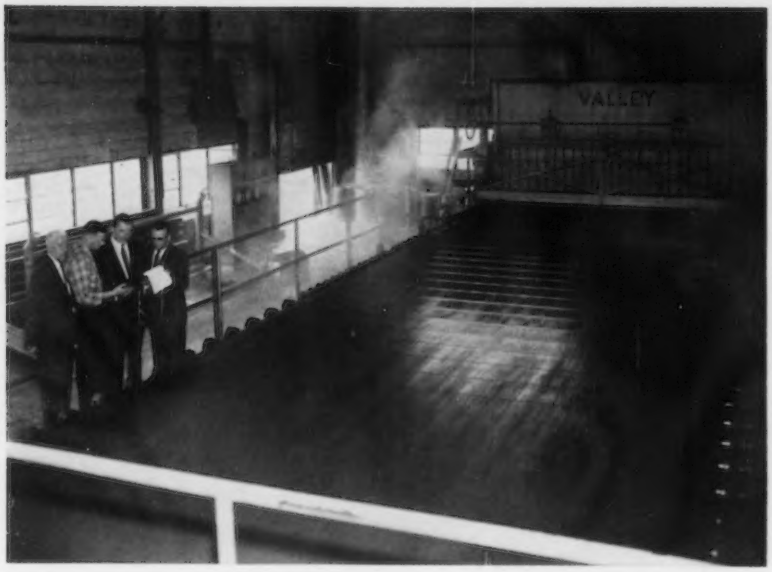
3. All-bronze wires would embrittle, and sections of the wire about match head size would drop out. Damage in the wire resembled a shot gun pattern.

4. In every instance, the wear on the warp wires was accelerated. Apparently, the corrosion products on the wearing surface of the warp strands would be wiped off by the boxes. This action exposed new surface to corrosive attack with every revolution of the wire.

Measuring Wire Wear

Wire wear is measured at Filer City by means of a 40X microscope fitted with a scale in the optical system. The length of the worn area on the underside of the warp strand is measured. The warp strand is worn to about half of its original thickness when the flat spot is .050 inches long (60 x 38 mesh wire). Wires are normally changed when the reading is between .046 inch and .050 inch.

Under the mildly corrosive conditions encountered prior to the change in cooking liquor, the wear on the



Officials check performance of stainless steel wire on one of PCA's 9-pt. board machines at Filer City, Mich.

warp strands reached .035 inch in about a week. From then on, the rate of increase in the length of the flat wear spot amounted to approximately .001 inch per day. With the change in cooking liquor in 1957, wire wear reached .046 inch in six to eight days.

Enter Stainless Wires

In 1957, we were advised that the W. S. Tyler Co. was experimenting with a stainless steel fourdrinier wire which would withstand the flexing to which it was subjected on a paper machine. We agreed to try these wires on our machines and to cooperate with the manufacturer in testing the wires. We realized that the wire was still in an experimental stage, and that some features, particularly the seam, remained to be perfected.

The first wire had a sewn seam and we expected this to be the weakest part of the wire. The wire drained very well and developed no more edge cracks than normal.

The seam wore out in 20 days. We cut the wire at the seam and removed it in one piece. The wire was shortened slightly, re-seamed, and again placed on the machine It ran 13 more days before the seam gave out.

We felt that the wire itself had great promise. The wear after 33 days was negligible, the drainage was still excellent, and edge cracks were not a problem.

We ran two wires with sewn seams on each machine. We found that all were satisfactory from the standpoints of drainage and edge cracks. The seam was not satisfactory.

New Welded Seams

We received our first wire with a welded seam in June of 1960. This wire was run on number one machine for 60 days before the seam started to fail. There was no corrosion, the drainage was still excellent, the wire seemed very resistant to bulges and ridges, and only three edge cracks appeared. The wear indicated that the wire had many days of useful life. In an attempt to see how long one of these wires would run, we removed one from our number two machine during a maintenance shut down after it had run 25 days. The wire was sent to Tyler for trimming, shortening and re-seaming. It was then installed on number one machine, where it ran an additional 56 days. At the end of 81 days of running, the wire was still draining well and the warp wear was only .038 inch-.040 inch.

Operating Experience

Our experience indicates that the stainless wires wear extremely well, drain efficiently throughout their life, are not a problem from the edge-crack standpoint, and are more resistant to bulges and ridges than ordinary wires.

Installation of the stainless steel wires is accomplished in the same manner as other metallic wires, and no major equipment or machine modification is required.

There has been no indication of increased suction box cover wear using the stainless wires. Our box covers are drilled end of grain maple and we carry a vacuum of three to five inches.

The cost of the wire is a little more than double that of our plated wires, but it will run on an average of three to four times longer. This is a double saving. Wire cost is reduced as well as the number of wire change down times. This latter is quite important since we operate seven days a week and wire changes affect labor and production costs throughout the entire corrugating medium mill. We feel that the use of stainless steel wires is very attractive from an economic standpoint.

Minor Problems

It has been necessary to make one minor change in the machines for running these wires. Stainless being extremely hard, the wires would cut through our wire guide pans in two to four days. By building up the face of these pans with stainless steel weld, we have reduced this action. A guide pan is now good for the life of the wire.

We have had one serious accident with a stainless wire. The wire rode up on the guide pan just above our facing weld and cut the pan. The cut pinched the edge of the wire and caused a 14-inch tear. The tear folded back, but the wire did not rip off the machine. While an ordinary wire would probably have torn across, the stainless, being extremely tough, did not. We hope that we can salvage enough of this wire to seam it for our smaller machine.

"TO SUMMARIZE: The use of stainless steel wires at Filer City has proven to be economically sound. There have been no operating problems connected with them. They have alleviated a serious wire life problem stemming from a corrosive and abrasive operation."

Paper Industry Cited for "Unhealthy Dependence" on Population Growth

The "new use" area will be the battleground of the future in relation to competitors with substitutes for paper.

The growth of paper consumption with the growth of population in the last decade has led some people to believe there is a direct relationship—hence paper consumption will continue to increase. However, statistics do not bear out this premise. This was the conclusion of A. Neil McLeod, economist, in a presentation at the Executives' Conference of the Institute of Paper Chemistry May 26. He said an analysis of "World Per Capita Paper Consumption," a report of the Export Committee of the A.P.P.A., "fails to reveal any predictable relationship between population growth and the increase in total apparent consumption of paper."

Among countries whose statistics he reviewed were France and the United Kingdom. With very nearly the same rates of population growth, they showed most of their increased consumption has been due to increases in per capita usage. In the Scandinavian countries where a degree of homogeneity that would produce a similar response to population growth and per capita consumption might be expected, it was shown Finland has been only a little more than half as dependent on population growth as have been Norway and Sweden. No constancy was shown in the degree to which different countries have been dependent upon population growth as a factor governing their increases in paper consumption.

From 1900 to 1960 in the U. S., increased use of paper per capita accounted for an average of 73 per cent total increase in paper consumption, but in the last decade "paper consumption has taken a strong turn from the vigorous growth due to new use . . . toward an unhealthy dependence on population growth," stated Mr. McLeod.

He continued, "In this century almost three-quarters of our industry's growth has been the result of new use per consumer. The potency of population growth loses its luster in determining our industry's future, when viewed in this light." Because growth of the pulp and paper industry has been largely due to new use, he suggested the "new use" area will be the battleground of the future in relation to competitors with substitutes for paper.

Foreign students at the Institute expressed views. Left to right (back row), Neftali Puentes, Bucaramonga, Colombia; Eng-su Chang, Feng-Yuen, Formosa; (front row), Gustav Paulsson, Perstorp, Sweden; Josef Gratzl, Vienna, Austria; M. G. Karnik, Dehra Dun, India; Hiroshi Matsuura, Tokyo, Japan.

Two Sides to Federal Support For Higher Education

Indicating there is an increasing tendency on the part of "high level panels and committees" to suggest the Federal Government as a source of support for scientific research and higher education, that people are more and more equating "national interest" and "federal financing," and that there are two sides to federal financing, John G. Strange, president of the Institute of Paper Chemistry, in his annual report told assembled executives that while the Institute would not "handcuff" itself with a "doctrinaire attitude," its "primary support must come from the pulp and paper industry and those who are interested in its welfare."

Forces behind the movement towards federal support were identified as an urgent concern with national security, demand for higher education on the part of more people, and "educators who seem just plain weary of hunting for funds from private sources, or who believe the academic world is neither adequately respected or compensated and that the social engineering necessary to change this situation can be accomplished only by government action." Other forces were active, according to Mr. Strange, but less well defined.

He made his remarks in reviewing the "general arenas" of higher education and science. It was here, he said, that the concept of "national interest," which people were equating with federal support, has become

John G. Strange
President

Roy P. Whitney
Vice President and Dean

A. Neil McLeod
Economist

so predominant, and it is in these general arenas in which the Institute has to pursue its professional affairs.

Educators or Politicians?

Mr. Strange said he could not subscribe to the concept that "any enterprise which relates to our natural or common interest must either be underwritten or directed at the national level." "Carried to its logical fulfillment," he said, "this concept would discard all of the hard earned lessons of the past and lead us to a complete, and unsuccessful imitation of the authoritarianism we are striving against."

Relating federal financing and direction to education and science, he stated, "The central or moral purpose of both education and science is to seek the truth, and, as Boris Pasternak has said so well, the truth is sought by individuals and not by institutions or governments."

Continuing on the same question, he said those who believe federal support would automatically solve all their "budgetary headaches" should "be sophisticated enough to realize that such funds will not necessarily flow freely and automatically to their own particular projects or institutions." "It will be necessary for them to become politicians . . . merely another way of saying they will be continuously faced with the burden of relevancy. There will be the need for seeing the right people at the right time on the right subject and in the proper idiom. And this it would appear, is the essence of politics."

Summarizing the financial basis of the Institute Mr. Strange said, "The plain fact is that our primary financial support must come from the pulp and paper industry and those who are interested in its welfare. If we serve this industry effectively, we shall be serving the national, or common interest."

Increase in Research

Continuing with the annual report, President Strange announced new records established by the present student body, an increase in total research, said "timeliness" in terms of education at the Institute meant not only today but also preparation for tomorrow, announced five new companies had joined the Institute's membership, and said a balanced budget was expected for the fiscal year in terms of $2¼ million, as he covered various phases.

Three new records have been set by the current student body. Numbering 75, it is the largest ever enrolled at the Institute. Twenty-one masters degrees being awarded in June will represent the first time an entire class has remained intact the first two years. While there are 30 doctoral candidates presently, last winter a record was set with 36.

In research, Mr. Strange reported an increase in both total research enterprise and in volume of co-operative work in the past twelve months. In co-operative work, 60 projects were initiated, and 46 were completed in the past year. Of 126 projects presently in progress, 24 were reported as group undertakings. Groups consisted of as few as three, to as many as 47 participants. He said all but two member companies had been served in recent months either through projects of their own, or by participation in group projects, or through consulting service.

Panel Sessions

Outlining the profile of research activities at IPC were staff members T. A. Howells, chief of special processes section; Harry D. Wilder, research aid, engineering and technology section; B. L. Browning, senior research associate, analytical chemistry group; and John Swanson, chief of the physical chemistry group.

Increasing interdependence of scientific disciplines in the natural sciences and the potential of molecular biology in the life sciences were emphasized in another panel session. Staff members Dale G. Williams, research aide, and E. O. Dillingham, research associate, made up the panel with Edward J. Jones, research associate, moderating.

Notes Student Shortage

"There is a serious shortage of scientists and engineers, both at the bachelor's degree and at more advanced levels," said Dr. Roy P. Whitney, dean and vice president of the IPC, in his presentation. He noted, "It appears evident that, particularly in chemistry and chemical engineering, this shortage will become more severe, at least for the next two or three years."

These two disciplines are the ones from which the Institute has drawn almost all of its graduate students, according to Dr. Whitney, and are probably the ones in greatest demand by the pulp and paper industry.

He stated, "It is easily shown that we have attracted more than our 'share' of top prospects. However, in the face of the increasing demand and the decreasing supply, the task is becoming more difficult each year."

Support of almost 125 thousand dollars a year for IPC's Pioneering Research Program was announced at the Conference. Twenty-four companies and foundations have subscribed the support for an initial period of five years according to the report made by Kyle Ward, Jr., chief of the Institute's cellulose group.

Four research projects have already been placed by the Program's Committee, and several more are in the process of consideration from the proposals so far received. Projects presently placed are at the University of British Columbia, Ohio State University, and the Institute of Paper Chemistry.

Procedures for the Care of Disk Refiners in the Stock Preparation Room

Good preventive maintenance consists of the following routine inspections of equipment during operation, with the necessary repairs as described below being made at the earliest possible date.

Ray Clay, Sales and Service,
and
David Sharp, Service Manager,
Bauer Bros. Co.

Responsibility for the maintenance of a refiner must be the concern of everyone who is involved in its operation. One very big step towards adequate maintenance (and very substantial savings) is a training program to inform all operating and maintenance personnel of the correct maintenance procedures.

To minimize downtime, it is advisable to have a recommended number of repair parts in stock. For some parts, such as bearings, this is not always necessary, if you have a reliable local supplier with an adequate stock. Regardless of the source of supply, repair parts must be readily available.

Record keeping is an important phase of any maintenance program. These records should include daily observations and comments from the individuals directly responsible for the refiner operation. A log book, kept handy near the refiner, is the simplest way of making sure no one overlooks reporting something unusual about the operation.

The contents of the log book can be reviewed, condensed, and discussed at regular meetings. Often, gradual quality changes and malfunctions can be detected that might otherwise continue, and progress to a place where emergency repairs are necessary.

Installation and Alignment

Proper installation of equipment plays a very important role in reducing maintenance costs, by providing maximum accessibility for maintenance and by eliminating stresses which might cause malfunctioning or breakdown later on.

The best possible location should be chosen for the refiner, and should provide for ample head room, sufficient working space for maintenance personnel, and space for proper routing of piping and wiring.

Equipment should be located immediately in the best possible spot, because temporary installation quite often restricts maintenance accessibility, and can even be hazardous. Furthermore, "temporary" installations have a way of becoming permanent.

When installing the refiner, remember that remote control equipment can be easily and economically provided at any time. This factor should give you much more flexibility in choice of locations.

The foundation is very important, and should have enough rigidity and mass to prevent misalignment of the motor and refiner, and to absorb damaging extraneous vibrations from adjacent machinery.

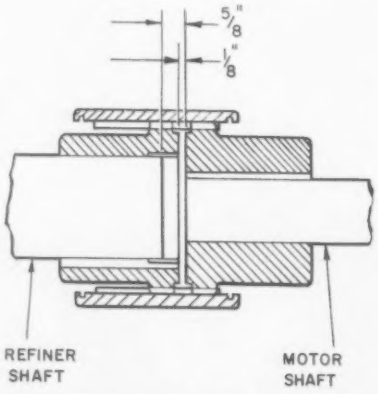


FIGURE 1: Allow ⅝ inch clearance between the motor and refiner shafts when installing coupling.

The pump-through pressure refiner is driven by an externally mounted motor which is separate from the refiner base. A 450-550 r.p.m. motor or other recommended speed should be direct-driven through a jordan gear-type coupling with approximately 5½ inches extended travel. If such a motor is not available, then one of a different speed can be employed, using a jack shaft arrangement to develop the same speed.

When aligning the coupling, ⅝ inch should be left between the ends of the refiner shaft and the motor shaft, and the coupling hubs should be set ⅛ inch apart. (See Figure 1.) The maximum allowable run out is .003 inches, for both parallel and angular alignment. The alignment check must be made with the refiner shaft in the extreme open position, to allow maximum coupling travel.

Once the refiner and motor have been properly aligned and secured to a suitable foundation, very little if any maintenance can be expected. Periodic lubrication every three months should be sufficient. Use an extreme pressure (E.P.) type grease. Alignment and wear should be checked annually. Since a coupling replacement could be considered a major item, any misalignment should be corrected to eliminate further wear. If the condition is such that replacement would soon be required, a new coupling should be obtained, machined to the proper shaft size and placed in stock ready for immediate installation. Unnecessary down time can certainly be reduced in the event of coupling failure.

Installing New Plates

The time required to change plates is generally around two hours. To install refining plates, the heads must be in the wide-open position. The case can be opened quickly for easy access to the disk. The face of the disk should always be cleaned, to insure proper seating of the new plate.

Although the disk is constructed of stainless steel, it is still important that it be thoroughly cleaned, since deposits of stock and material on the disk might cause the new plate segments to break when they are installed, and might also cause the refiner to run roughly, perhaps resulting in an inferior product.

Since each set of plate segments is machined and balanced as a unit, the segments are, therefore, not interchangeable between sets. Ring numbers and individual segment numbers are painted on the back side to identify each. When installing a new set of segments, be sure that they are in the proper sequence (0-0, 1-1, 2-2, etc.) (See Figure 2.)

Each plate segment is attached to the disk by stainless steel socket head bolts. The heads of these bolts are counter-sunk in the plate to prevent wear and erosion. Check to make certain that each socket, or recess, is in good condition to facilitate removal at the next plate change.

The choice of the alloy composition of a plate is determined by pulp characteristics (whether it is abrasive or corrosive, etc.) and here again the refiner manufacturer's experience is usually relied upon. Plates are usually best suited to run in only one direction of rotation, this direction being determined by through-put and pulp quality.

Tramp Metal Hazards

Every precaution should be taken to keep tramp iron out of the system. However, should a piece enter the refiner with the stock, power to the refiner motor should be shut off before opening disks. Plates should be inspected to determine if any segments have been damaged. If any segment is damaged, replace entire circle of plates.

If the remaining segments are in good condition in that circle, they can be returned to the factory for replacement of the damaged segment and regrinding.

Tramming

Each new refiner has been accurately trammed and doweled at the factory. However, the tram should be checked before start-up, to be sure no damage has occurred in shipment.

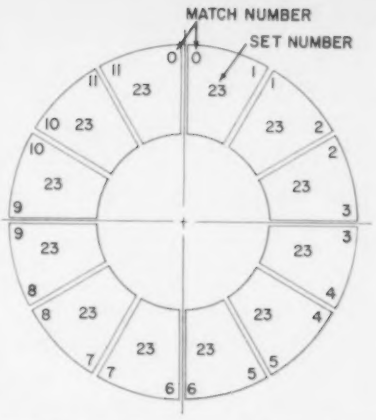


FIGURE 2: Half a set of refiner plates, showing numbering scheme on back.

The proper tramming method is to remove the refining plates and fasten a dial indicator to a bolt on the rotating head. The indicator point should contact the plate seat on the stationary head, near the outer edge. A second indicator should be placed at the motor end of the shaft or coupling, to indicate any drift of the head and shaft assembly.

Rotating the head will indicate if the plate seat is out of perpendicular with the axis of the shaft. (See Figure 3.) Indicator readings should be checked at the top, bottom, and both sides of the head. Readings should be within .004 inches, when the head is rotated. If it is necessary to correct alignment, shims should be placed where the stationary head is bolted to the bearing housing.

It is almost an impossibility for any machine stresses caused by case pressures or temperatures to affect the tram once it has been installed and set properly. The only time that the tram might change is if the refiner has been torn down for a major overhaul.

If care is taken in marking the shims during disassembly, and they are put back in the same location during reassembly, the tram should not change. It is always recommended that it be checked afterward, regardless of care given in reinstalling the shims. The small amount of time required to do this is certainly justified.

Bearing Lubrication

Before any new machine is put into operation, special consideration should be given in selecting the proper type of lubricant. The equipment manufacturer specifies a type that best fits the conditions under which the machines operate most satisfactorily. Lubricants for each refiner can be shown on a lubrication specification plate permanently attached to the machine base. This plate generally names only one type and grade; however, any equivalent

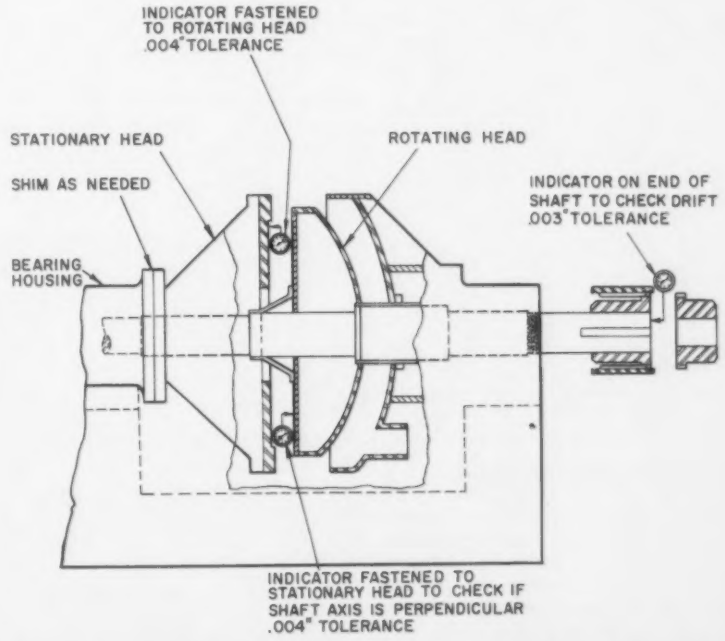

INDICATOR FASTENED TO ROTATING HEAD .004" TOLERANCE
STATIONARY HEAD
SHIM AS NEEDED
ROTATING HEAD
INDICATOR ON END OF SHAFT TO CHECK DRIFT .003" TOLERANCE
BEARING HOUSING
INDICATOR FASTENED TO STATIONARY HEAD TO CHECK IF SHAFT AXIS IS PERPENDICULAR .004" TOLERANCE

FIGURE 3: Placement of indicators when checking shaft and head alignment.

could be obtained from any reputable supplier, provided it meets the same specifications.

The refiners are equipped with a dual purpose oil system in which the same pump supplies circulating oil to lubricate the bearings and also operates the hydraulic controls for positioning the refining disk.

An adequate flow of oil should be maintained to the bearings at all times. An insufficient amount can cause abnormal bearing wear and shorten the expected life. Excessive oil can cause heat by bearing flooding and create oil seal leaking problems.

Because of high pressures common in any hydraulic system, a certain amount of heat is generated. A water-cooled heat exchanger is used to lower the oil tank temperature to a recommended range of 110-130° F. If oil temperatures consistently run above this, the cooler should be checked to be sure some of the tubes are not plugged. When unusually warm supply water is used here, it is often advisable to replace the heat exchanger with a larger one with more heat dissipating capacity.

The oil change frequency will depend on varying mill conditions such as bearing thrust load, water condensation accumulation and the ability of the oil to withstand its intended purpose without breaking down or emulsifying. It is recommended that the oil be changed at least every six months. The tank should be drained and thoroughly cleaned at each oil change. The pump strainer should be removed and flushed before installing the new oil. The filter should be checked periodically to insure a free flow of oil for lubrication without too much restriction to flow. The condition of the filter and an oil sample from the tank will serve as the best indications in determining the time for oil change.

When periodic inspection of the oil is made most hydraulic, lubrication and down time problems can be completely eliminated. If the oil is contaminated and can be changed at a scheduled shut down, it definitely is the most economical way of doing it.

Hydraulic System Maintenance

There are several points of possible malfunctioning in any hydraulic system. A few of the more common difficulties and possible causes are listed with suggested remedies. Illustrations and parts lists of hydraulic components are shown in the service manual supplied with the machine. It should be referred to when you are trouble shooting.

FAILURE TO BUILD UP PRESSURE

1. Check pump drive. Make certain coupling is not loose on pump drive shaft.
2. Check pump rotation.
3. Check fluid level in reservoir. Make certain sight gauge is not plugged, providing faulty reading.
4. Check for contaminants in relief valve causing it to stick open.
5. Check springs in relief valve to be sure one is not broken.
6. Check strainer on pump suction line for dirt.
7. Check for air leaks in intake line.
8. Disconnect pressure line and see if pump is delivering fluid.
9. If pump delivers fluid, connect to a proven relief valve and direct the flow from the relief valve to the reservoir and see if the pump will generate sufficient pressure with this test valve.

NOISY PUMP

1. Check for vacuum leaks in suction line.
2. Check for vacuum leak in pump shaft seal.
3. Check alignment of coupling.
4. Check for worn vanes or ring if pump delivery is not adequate.

NOISY RELIEF VALVE

1. Oil temperature too high. Check operation of oil cooler to be sure it is cooling properly.
2. Piston scored, allowing too much control oil to pass to pilot mechanism.
3. Worn pump with pulsating delivery can become sufficiently erratic to prevent relief valve from leveling out pulsations.

Stuffing Boxes

Stuffing boxes must be adequately water-purged with clear filtered water at all times. The supply pump pressure should be set at 100 to 120 p.s.i. minimum. The purpose of the purge water is to lubricate the packing and create a seal to prevent stock from getting under the packing. If the packing becomes worn and is not kept reasonably tight, stock leakage will occur and accelerate sleeve wear.

When the packing has worn beyond the practicable take up point, it should be replaced with a type approved by the refiner manufacturer. The packing glands should be removed and cleaned before ever installing new packing. After the new packing is installed the clearance should be checked to be sure the gland does not rub the shaft sleeve. Recommended minimum clearance at any point around the shaft is .010 inch.

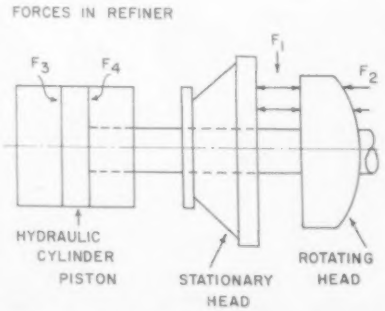


FIGURE 4: Position the head by balancing the four forces shown.

Safety in Operation

The stock preparation refiner is simple to operate, and is easily adjustable to perform the desired task. When starting the refiner, the oil pump and water pump must be started first. After adjusting the lubricating oil flow to the bearing and the purge water flow to the packing, the main drive motor can be started. Operation of the refiner then requires only three simple steps:

1. Start the stock through the refiner and adjust the stock valve on the discharge or the outlet side, to regulate the desired flow of stock through the refiner.
2. Close a directional control valve in the hydraulic system to bring the heads together into refining position.
3. Adjust the hydraulic loading pressure to the desired motor load.

The hydraulic system, with its control valves, enables the operator to adjust quickly for the type of stock desired and to maintain uniform quality. Briefly, this is the way it functions:

The rotating head is positioned by balancing the four forces shown in Figure 4 to obtain the desired refining. F_1 is the force developed by the pressure of the stock between the refining plates which tends to open or force the plates apart. F_2 is the force developed by the pressure of the stock in the case acting on the back. The force (F_2) developed in the case, with some types of plates, may be greater than F_1, in which case a force (F_3) on the opening side of the hydraulic cylinder is necessary to achieve good control. The force F_4 is controlled by the operator to accomplish the desired degree of refining.

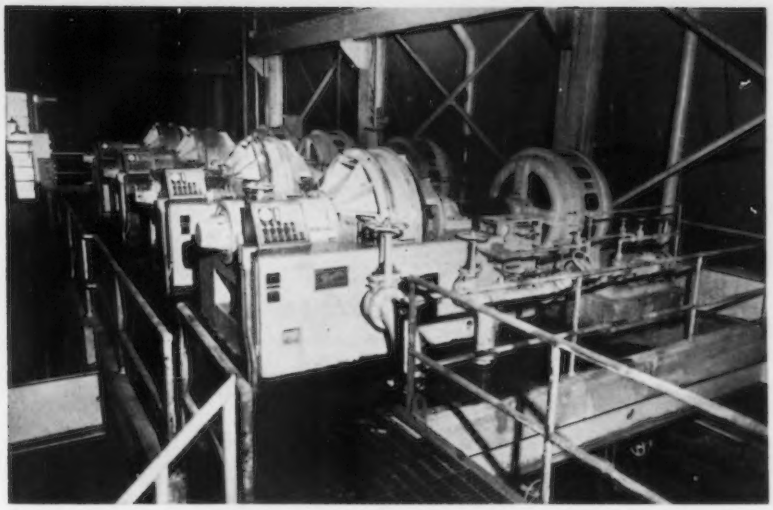


FIGURE 5: A battery of properly installed and operating pressure type disk refiners.

A stock pressure switch installed in the inlet stock line which supplies the refiner is interlocked with the hydraulic loading pressure controls. In event of stock pump failure or unusually low line pressure, the refining disk will open, preventing damage to the plates or machine. The pressure switch should always be in operating condition to insure safety. The adjustable micro-limit switch located inside the stock pressure gauge or safety switch, should be set to open and close the electrical circuit at 10 to 12 p.s.i.g.

Electrical and hydraulic controls should be checked regularly to insure safe and trouble free operation. The The water pump and oil pump starters should always be interlocked with the starting circuit of the main drive motor. This reduces the possibility of ruining th bearings or plugging the packing purge water lines in the event the motors fail. It also prevents the operators from starting the refiners without starting the lubrication and water pumps.

Indication of Malfunction

Usually, the refiner operator is the first to detect trouble. His findings should be reported directly to the repairman doing the job, since relaying the information through channels will often result in conflicting reports, which might only prolong down time.

Regular checking of stock quality records is also very important, since such records indicate gradual changes in product quality which might otherwise go unnoticed.

Field service men are available from the refiner manufacturer for the start-up of new equipment, and for assistance in repairs and maintenance and production problems. The instruction manuals furnished with the refiner will also prove quite helpful in answering most common questions.

Should any unusual problem arise in the servicing of equipment, it pays to talk it over thoroughly and right away with the manufacturer's service department. The cost of a long distance phone call for such a purpose looks mighty small when compared to pulling a refiner out of production for any length of time.

Modern Methods of Mechanical Pulp Manufacture

This book comprehensively covers all aspects of groundwood pulp production. The author K. H. Klemm, has a broad knowledge of groundwood manufacturing methods and has been associated with groundwood mills on both sides of the Atlantic. Price: $5.00.

CONTENTS

The Raw Material: Wood

Heterogeneity of Wood 8
Effect of Pulpwood Quality 17
Pulpwood Transportation to the Mill and Wood Storage Methods 27
Wood Handling Within the Mill 33
Removing the Bark from Pulpwood 38
Barking Methods and Bark Disposal 45
Modern Woodyard Systems 56

The Groundwood Mill

Theoretical Aspects of Production 63
Factors Influencing Grinder Capacity 71
Modern Grinder Types 75
Stones and Stone Handling 87
Grinder Drives and Governors 97
Coarse Screening and Rejects Recovery 102
Grinder Room Arrangement 106
Mill Manpower Requirements 108
Problems of Groundwood Quality 111
Routine Testing and Control Methods 114
Instrumentation in a Groundwood Mill 121
Grinder Control 125
Control and Record Keeping 138

Groundwood Stock Preparation

White Water Systems 144
Screening Methods and Principles 151
Modern Equipment for Screening 174
Theoretical Considerations of Screening Systems 183
Thickening 190
Bleaching 202
Stock Chest and Storage Systems 212
Fraction Mixing Process 217
Groundwood from Steamed Wood Blocks 220
Chemical Treatment Processes 223
Mechanical Pulp from Disk Refiners 229
Comparison of Groundwood Pulps 234

Closing Remarks

Economic Importance, Main Properties, and Uses of Groundwood 237

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Accurate Centrifugal Vacuum Pump Sizing

J. C. Schildwachter,
Fluid Dynamics Department,
Allis-Chalmers Mfg. Co.

Among the problems encountered by papermakers when considering the use of a centrifugal exhauster in a mill expansion or modernization are those of making a quick estimate of the brake horsepower of the exhauster, and the approximate speed and discharge temperature, without the bother of requesting bids. A means of doing this swiftly is described here.

What Centrifugal Exhauster Is

Before delving into the procedure outlined in this story, let's talk about a centrifugal exhauster. What is it? It is a machine designed to take a given volume of air and, by centrifugal force, convert a dynamic head to a pressure head. The air enters at a low pressure or vacuum and is raised to a higher pressure as it passes from stage to stage within the exhauster. The operation is similar to that of a centrifugal pump. Schematically, an exhauster may be represented as shown in Figure 1. By introducing air flows at various intermediate points, the exhauster may handle several vacuum levels. This is shown in Figure 2.

Estimating Exhauster Performance

On the four following pages is a step by step procedure to estimate exhauster performance. To simplify this process, several assumptions were made that might introduce a small error in the results. For this reason, this procedure should be made for approximating.

To explain and further clarify this procedure an example problem has been added in bold face on the fill-in portion of this procedure. The purpose of this example, assume three vacuum levels at 20, 15 and 10 inches of mercury (including system losses) and volume of 20,000; 10,000 and 5000 c.f.m. respectively.

Sizing Procedure For Centrifugal Exhausters

These four points must be understood before proceeding with selection:

1. Assume inlet temperature at all inlets is 95° F. = 555° R.

2. In all calculations temperature is to be expressed in degrees rankine (degrees Fahrenheit plus 460).

3. In all calculations (except when reading from curve 2) vacuum is to be expressed in pounds per square inch absolute (p.s.i.a.). Usually paper mill vacuums are expressed in inches of mercury vacuum ("Hg.). To obtain p.s.i.a., subtract the given vacuum expressed in inches of mercury from 30 and multiply by 0.491.

For example: Given 10 inches of mercury vacuum,

$30 - 10 = 20$

$20 \times 0.491 = 9.82$ p.s.i.a.

4. The following procedure is based on a unit handling three vacuum levels. If only two are required, disregard steps 30 through 48; if only one, disregard steps 11 through 48.

5. The volumes and vacuums used in these calculations reflect the actual conditions at the exhauster inlet flange. For safe approximating it would be well to account for possible losses in the vacuum system prior to the exhauster inlet flange. A system loss of 2 inches of mercury for each inlet should be more than adequate.

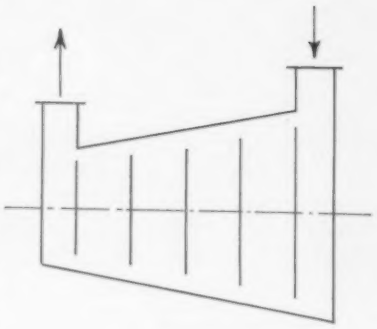


FIGURE 1

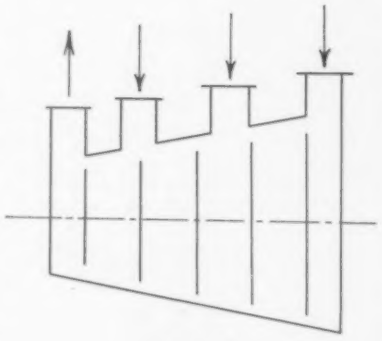


FIGURE 2

Definition of Terms:
Q = Volume, c.f.m.
W = Weight Flow, lbs./min.
R = Gas Constant
B = Mean Effective Pressure Ratio

Optional Added Information

Discharge Temperature:

A. Find temperature ratio from Curve 6 based on pressure ratio between inlet C and discharge

B. Multiply temperature at Point 4 by temperature ratio found in Step A.

Discharge Volume:

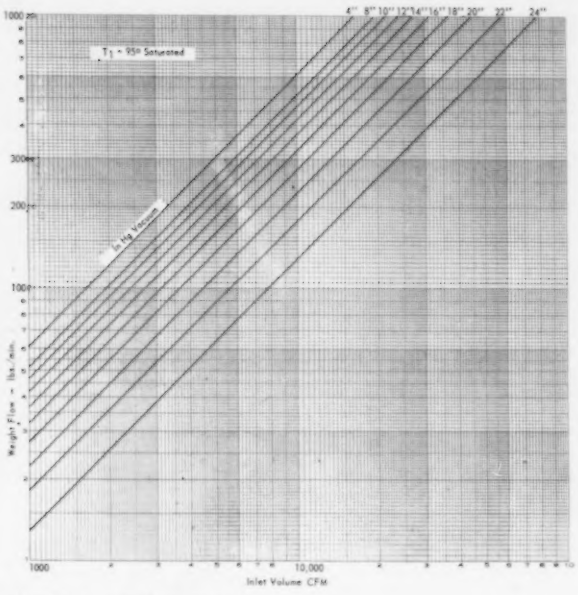
$$Q_{discharge} = \frac{(W_A + W_B + W_C)_{\text{Step 30}} \quad (R_4)_{\text{Step 40}} \quad (\text{Discharge Temp.})}{2120}$$

To facilitate its use, the procedure as shown in this report was prepared as a fill-in type form. After completing or filling in the necessary blanks the form may be filed and serve as an easily checked record for future use.

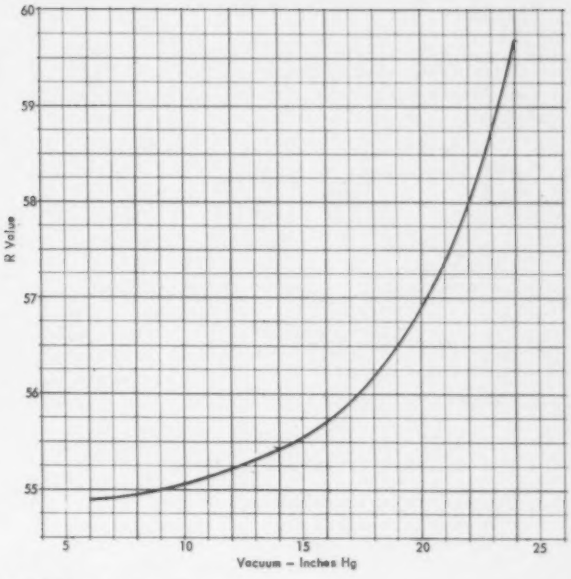
One point should be made clear: the rotative speed obtained in this procedure must be considered an approximation. In the steps used to determine speed the greatest assumptions were made and therefore the greatest chance for inaccuracy is present in this area. Speed is also, to a certain extent, a function of the particular manufacturer's design. The other results of this procedure are relatively accurate.

As mentioned previously, this procedure is strictly an estimating tool. However, if used properly, it can serve as a handy guide for vacuum system planning.

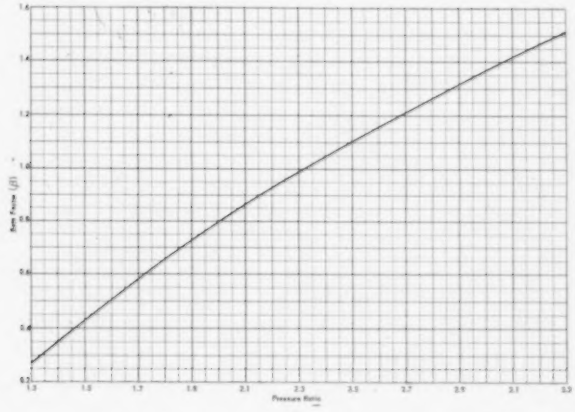
CENTRIFUGAL EXHAUSTER SELECTION CURVES



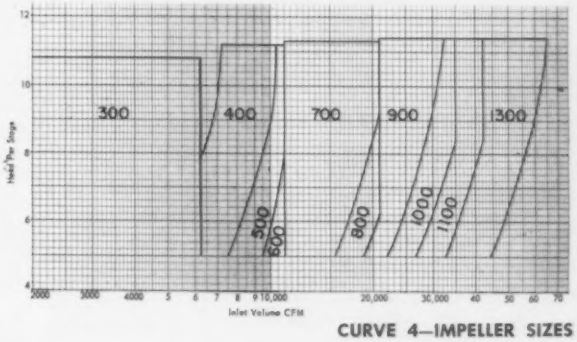
CURVE 1—WEIGHT FLOW



CURVE 2—R VALUE

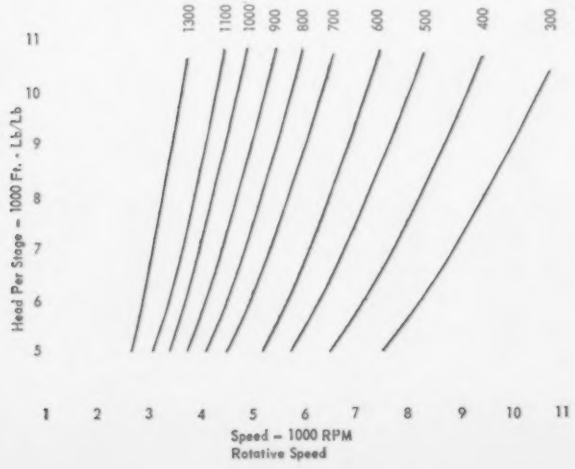


CURVE 3—BETA FACTOR

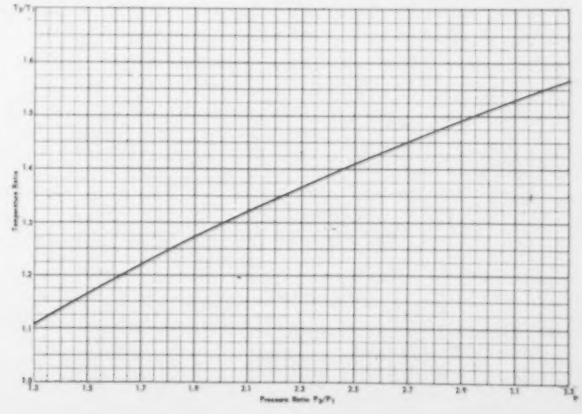


CURVE 4—IMPELLER SIZES

CURVE 5—SPEED



CURVE 6—PRESSURE TEMPERATURE



Step No.	Procedure	Fill-In (Sample problem given in third column)	
1	Total volumes at each vacuum level	At inlet A = Q_A =	20,000 c.f.m.
		At inlet B = Q_B =	10,000 c.f.m.
		At inlet C = Q_C =	5,000 c.f.m.
2	From Curve 1 obtain weight flow at each vacuum level	At inlet A = W_A =	450 lbs./min.
		At inlet B = W_B =	345 lbs./min.
		At inlet C = W_C =	232 lbs./min.
3	From Curve 2 obtain R value at each vacuum level	At inlet A = R_A =	56.9
		At inlet B = R_B =	55.6
		At inlet C = R_C =	55.1
4	Determine pressure ratio between points A and B dividing absolute pressure at B by absolute pressure at A	$\frac{P_B \text{ (p.s.i.a.)}}{P_A \text{ (p.s.i.a.)}}$ =	$\frac{7.37}{4.91} = 1.50$
5	Find corresponding β for pressure ratio found in Step 4 from Curve 3	β =	0.43
6	Calculate head between inlets A and B Head = $R_A \times T_A \times \beta$ Temp at inlet A = 550°R.	Head = Step 3 × 555 × Step 5 =	56.9 × 555 × 0.43
		=	13,579
7	Determine head per stage by dividing head found in Step 6 by highest number of stages that will give a head per stage of less than 10,500	$\frac{\text{Step 6}}{\text{No. of stages}}$ =	$\frac{13579}{2} = 6789$
8	From Curve 4 select impeller size using volume at inlet A (Step 1)	Impeller size =	800
9	Using impeller size found in Step 8 and head per stage found in Step 7 use Curve 5 to determine speed	Speed =	4800 r.p.m.
10	Calculate horsepower between inlets A and B $HP_{AB} = \frac{\text{Head} \times \text{Weight Flow A}}{24800}$	$HP = \frac{\text{Step 6} \times \text{Step 2}}{24{,}800}$ =	$\frac{450 \times 13579}{24{,}800} = 246$
11	Determine total weight flow at point 2 by adding weight flows A plus B found in Step 2	$W_A + W_B = W_2$ =	450 + 345 = 795
12	From Curve 6 determine temperature ratio between points A and 1 using pressure ratio found in Step 4	Temp. Ratio =	1.167
13	Multiply temperature ratio found in Step 12 by temp. at inlet A (555°R.) to find temp. at point 1	Step 12 × 555 = T_1 =	1.167 × 555 = 648° R
14	Multiply weight flow at inlet B (Step 2) by temp. at inlet B (555°R.)	Step 2 × 555 = $W_B T_B$ =	345 × 555 = 191,000
15	Multiply weight flow at inlet A (Step 2) by temp. found in Step 13	Step 2 × Step 13 = $T_1 W_A$ =	450 × 648 = 292,000
16	Add Steps 14 and 15 $W_B T_B + T_1 W_A$	Step 14 + Step 15 =	483,000
17	Divide Step 16 by Step 11 to find temp. at Point 2 $\frac{T_B W_B + T_1 W_A}{W_A + W_B} = T_2$	$\frac{\text{Step 16}}{\text{Step 11}} = T_2$ =	$\frac{483{,}000}{795} = 608°$ R
18	Multiply R value (Step 3) at inlet A by weight flow into inlet A (Step 2) $R_A \times W_A = R_A W_A$	Step 2 × 3 =	450 × 56.9 = 25,600

Step No.	Procedure	Fill-In (Sample problem given in third column)
19	Multiply R value at inlet B (Step 3) by weight flow into inlet B (Step 2) $R_B \times W_B =$	Step 2 $\times$ Step 3 = $345 \times 55.6 = 19{,}200$
20	Add Steps 18 and 19 $R_AW_A + R_BW_B$	Step 18 + Step 19 = $44{,}800$
21	Divide Step 20 by Step 11 $\frac{R_AW_A + R_BW_B}{W_A + W_B} = R_2$ To obtain R value at Point 2.	$\frac{\text{Step 20}}{\text{Step 11}} = R_2 = \frac{44{,}800}{795} = 56.3$
22	Determine total volume at Point 2 = Q_2 $\frac{Q_2\ (W_A + W_B)\ (R_2)\ (T_2)}{(144)\ (P_B)} P_B =$ Press. in p.s.i.a. at inlet B	$Q_2 = \frac{\text{Step 11} \times \text{Step 21} \times \text{Step 17}}{144 \times P_B} = \frac{795 \times 56.3 \times 608}{144 \times 7.37} = 25640$ c.f.m.
23	Determine pressure ratio between points B and C by dividing pressure at C by pressure B	$\frac{P_C\ (\text{p.s.i.a.})}{P_B\ (\text{p.s.i.a.})} = \frac{9.82}{7.37} = 1.33$
24	Find corresponding β for pressure ratio found in Step 23 from Curve 3	$\beta = 0.295$
25	Caculate head between inlets B and C Head = $(R_2) \times (T_2) \times (\beta)$	Head = Step 21 $\times$ Step 17 $\times$ Step 24 = $56.3 \times 608 \times 0.295 = 10{,}100$ ft.
26	Determine head per stage by dividing 25 by highest number of stages that will give a head per stage of less than 10,500	$\frac{\text{Step 25}}{\text{No. of stages}} = \frac{10{,}100}{1} = 10{,}100$
27	From Curve 4 select impeller size using volume at point 2 (step 22)	Impeller size = 1000
28	Using impeller size found in Step 27 and head per stage found in Step 26 use Curve 5 to determine speed	Speed = 4800 r.p.m.
29	Calculate horsepower between inlets B and C $HP_{AB} =$ $\frac{\text{Head} \times \text{(weight flow A + B)}}{24{,}800}$	$HP = \frac{\text{Step 25} \times \text{Step 11}}{24{,}800} = \frac{10{,}100 \times 795}{24{,}800} = 324$ HP.
30	Determine total weight flow at Point 4 by adding weight flows A plus B plus C found in Step 2	$W_A + W_B + W_C = 450 + 345 + 232 = 1027$ lbs./min.
31	From Curve 6 determine temperature ratio between Points 2 and 3 using pressure ratio found in Step 23	Temp. Ratio = 1.12
32	Multiply temperature ratio found in Step 31 by temp. at Point 2 (Step 17) to find temp. at Point 3	Step 31 $\times$ Step 17 = T_3 = $1.12 \times 608 = 681°$ R.
33	Multiply weight flow at Point 2 (Step 11) by temp. at point 3 (step 32)	Step 11 $\times$ Step 32 = $T_3 W_3$ = $795 \times 681 = 541{,}400$
34	Multiply weight flow at inlet C (Step 2) by temp. at inlet C (555°R)	Step 2 $\times$ 555 = T_CW_C = $232 \times 555 = 129{,}000$
35	Add Steps 33 and 34 $W_CT_C + T_3W_3$	Step 33 + Step 34 = $670{,}400$

Step No.	Procedure	Fill-In (Sample problem given in third column)	
36	Divide Step 35 by Step 30 to find temp. at Point 4 $\frac{T_C W_C + T_2 W_2}{(W_A + W_B + W_C)} = T_4$	$\frac{\text{Step 35}}{\text{Step 30}} = T_4 =$	$\frac{670{,}400}{1027} = 653°$ R.
37	Multiply R value (Step 21) at Point 2 by weight flow at Point 2 (Step 11) $R_2 \times (W_A + W_B) =$	Step 21 × Step 11 =	56.3 × 795 = 44,800
38	Multiply R value at inlet C (Step 3) by weight flow into inlet C (Step 2) $(W_C \times R_C)$	Step 2 × Step 3 =	55.1 × 232 = 12,800
39	Add Steps 37 and 38 $R_C W_C + R_2 (W_A + W_B)$	Step 37 + Step 38 =	57,600
40	Divide Step 39 by Step 30 to obtain R at Point 4	$\frac{\text{Step 39}}{\text{Step 30}} = R_4 =$	$\frac{57{,}600}{1027} = 56.1$
41	Determine total volume at Point 4—Q_4 $Q_4 = \frac{(W_A + W_B + W_C)\ (R_4)\ (T_4)}{144\ P_C}$ Absolute press. at inlet C = P_C	$Q_4 = \frac{\text{Step 30} \times \text{Step 40} \times \text{Step 36}}{144\ P_C} =$	$\frac{1027 \times 56.1 \times 653}{144 \times 9.82} = 26{,}600$
42	Determine pressure ratio between Points C and discharge by dividing discharge press. (14.7) p.s.i.a by absolute pressure at C	$\frac{P_{Dish.}\ \text{(p.s.i.a.)}}{P_C\ \text{(p.s.i.a)}} = \frac{14.7}{P_C} =$	$\frac{14.7}{9.82} = 1.50$
43	Find corresponding β for pressure ratio found in Step 42 from Curve 3	$\beta =$	0.43
44	Calculate head between inlets C and discharge Head = $R_4 \times T_4 \times \beta$	Head = Step 40 × Step 36 × Step 43 =	56.1 × 653 × 0.43 = 15,750 ft.
45	Determine head per stage by dividing head found in Step 44 by highest number of stages that will give a head per stage of less than 15,000	$\frac{\text{Step 6}}{\text{No. of stages}} =$	$\frac{15{,}750}{2} = 7875$
46	From Curve 4 select impeller size using volume at Point 4 (Step 41)	Impeller size =	900
47	Using impeller size found in Step 46 and head per stage found in Step 45 go to Curve 5 and determine speed	Speed =	4700 r.p.m.
48	Calculate horsepower between inlet C and discharge $HP = \frac{\text{Head} \times \text{(wt. flow A + B + C)}}{24{,}800}$	$HP = \frac{\text{Step 44} \times \text{Step 30}}{24{,}800} =$	$\frac{15{,}750 \times 1027}{24{,}800} = 652$ HP.
49	Add horsepowers found in Steps 10, 29 and 48 plus 35 HP to obtain total brake HP of exhauster	Step 10 + Step 29 + Step 48 + Total BHP =	246 324 652 35 1257 HP.
50	Approximate speed of exhauster will be highest speed of those obtained in Steps 9, 28 and 47	Speed =	4800 r.p.m.
51	Add number of stages together as found in Steps 7, 26 and 45	No. of stages =	5

An Investment Man Looks at the Fiber Box Industry

What is Wrong With the Corrugated Box Business...

. . . and what should be done about it. The author in this very frank article points out that competition should be in the areas of quality, service and product improvement rather than by price cutting.

Carl Holzheimer,
Senior Partner,
Security Supervisors

Corrugated box manufacture is an important part of the broader industry that the investment man refers to when he talks about "the paper industry," the nation's fifth largest industry, producing 35 million tons of products, employing a half-million persons and vital to the over-all health of our economy. This is an industry with a somewhat unusual investment history, referring in this instance to "investment history" as attitudes expressed toward an industry by professional investment men. Prior to World War II, very little investment interest was aroused by the industry you represent. There was a feast and famine history. There were many, many companies. There was under-capitalization. There was too much debt. There was a "dog-eat-dog" approach, particularly in periods of slight to moderate business decline. There was, over-all, an unattractive financial record.

The pressures of World War II, the increasing sophistication of business managements, the necessity for large and better integrated operation, all occurring in an environment that diminished the immediate importance of price, provided the background against which the industry began a long and profitable period of concentration, and of integration both horizontally and vertically. Finances improved, records were interesting and somewhere in the relatively early post-World War II period one began to hear reference to the paper industry as "a growth industry".

Is it a Growth Industry?

I would suppose, the stock market being what it has been during the last six months, you are all familiar with the concepts involved in investment reference to "a growth industry." If it is proper to refer to a basic investment fad, at the present time, the fad is concentration on growth. So long as an investment man looks at a basic industry and continues to label it "a growth industry," he is likely to adopt a lenient attitude towards declines in any of the statistics providing that the declines are not too long continued. He is inclined to recommend purchase of the securities. He is inclined to expect, and in important respects, help to create higher price-earnings ratios. He forgives, perhaps even enthusiastically condones, a very low dividend. But let him conclude that a particular industry is not a growth industry, or that its growth has terminated, and everything changes, starting with a change in the investment man's interest and approach.

There are relatively few industries where the situation is clear-cut, one way or the other. You are not a part of such an industry. One could make selections from among the vast body of statistics that your industry collects and publicizes to illustrate either the growth story or the non-growth story. If growth is emphasized, one might look at figures covering the per capita production of all paperboard products including not only those used in your industry, but all other kinds of paperboard as well. It makes a rather nice looking picture and particularly nice if one simply looks at the ten year result—

154.1 pounds in 1950
176.2 pounds in 1960

Growth is illustrated by an examination of shipment volume in the corrugated and solid fiber field alone where shipments of just above 78 billion square feet in 1950 compared with 109 billion in 1960. Once more the growth story is much better if we look only at the beginning and the end. Much less attractive if we pause to note that in five of these years there was no growth at all.

Proof of Lack of Growth

If one attempts to demonstrate the lack of growth in your industry an unfortunately large number of series would be available. Perhaps the most striking would be an examination of the relationship between the value of your shipments and gross national product. In 1950 your product shipments amounted to .371 per cent of Gross National Product, in 1960 they amounted to .354 per cent. The decision of investment men to look at your industry as a growth industry or as a non-growth industry is vital. What makes the difference? What is the thing that an investment man looks at to decide? It's not very mys-

"By this vital test your industry has failed, and failed in so extreme a degree that it would not be improper to refer to it as a calamity and a calamity that requires your instant and concentrated attention."

terious. It's profits—because from an investment point of view a growth industry is an industry where profits increase at rates in excess of the general economy; where declines in recession periods are less than the decline in the economy and where each successive peak be it in the Federal Reserve Board's Index of Industrial Production or in Gross National Product is accompanied by a new and preferably higher percentage peak in earnings per share.

By this vital test your industry has failed, and failed in so extreme a degree that it would not be improper to refer to it as a calamity and a calamity that requires your instant and concentrated attention. I am pleased to note increasing attention to this failure—Larry Gessner of Smith Barney has delivered a useful critique of your troubles. It appears in the March 9, 1961, issue of "The Commercial and Financial Chronicle".

"The problem is so clear, the difficulty so evident, that I will presume to suggest that your problems are almost exclusively within the area of pricing."

Sorry Profit Performance

In my office in Chicago we maintain files and statistical follow-up work on 10 of the 20 largest companies in your industry. I do not intend to name them, but I do intend to point to the sorry profit performance of these companies. Seven of the ten show zero earnings growth between 1950 and 1960, and if it weren't for a fraction of decimal point, I could say eight rather than seven. Two out of the ten barely managed to show a small gain between 1955 and 1960. Once more, eight of the companies earned no more money in 1960 than they earned in 1955. If we combine the per share results of these ten companies — simply adding the dollar per share earnings of each of the ten companies, we find that total earnings of $24.88 for 1955 compared with $20.17 in 1960. This is serious. This is sad. This is not a background against which you can expect a very favorable view from the investment fraternity.

Since your business like most others is not a one-way street, but rather a business that falls into cycles, albeit not very severe from the point of view of production, it follows that you are unlikely to operate above 93 per cent of capacity for any important length of time. If you continue to cut prices whenever times are a little rough, whenever production is declining slightly below 93 per cent, you are in effect announcing to one and all—and certainly you are announcing to investment analysts — the fact that you consider yourself a cyclical rather than a growth industry.

We are a skeptical, perhaps a cynical breed of men. We have to be shown. You are constantly told that you are part of a growth industry and that you have a growth company. What are we supposed to think when managers of the fiber box industry act in complete refutation of the normal managerial concepts flowing from a true growth business. If you don't believe you are a growth business, it is not logical to expect investment people to think so. If you act in ways that are contrary to the natural managerial actions flowing from growth, we will necessarily be suspicious.

Problems Mostly Pricing

I would be far more presumptious than I have any right to be if I thought that I could offer much by way of constructive comment to men who have spent their lifetime in this field, but the problem is so clear, the difficulty so evident, that I will presume to suggest that your problems are almost exclusively within the area of pricing. Tonnage in your industry is predetermined by outside factors. So far as you are concerned demand is inelastic-particularly is it unresponsive to moderate price influence--a few per cent up or down in packaging cost hardly touches your tonnage results, but they make or break your profits.

I cannot tell you the "why" of your pricing problems—many factors are involved — many influences are at work—but one deserves particular emphasis—you are not a single industry. Board manufacture and container production are different. Part —perhaps most—of your problems stem from vertical integration with some 70 per cent of box plants now owned by integrated companies and only 30 per cent properly identifiable as independent. These are different businesses, one producing a standard product on a 24 hour basis — the other a service specialist. Integration is fine if you don't surrender the needed profit of the converter in order to run a paper machine a few hours more, because obviously you're not going to run those extra few hours—at least no longer than it takes your competitor to do the same thing. You are a competitive industry, competitive among yourselves, competitive with other industries and I would urge you to become more so, not less so. But there are ways and means, there is good competition and there is self-defeating competition.

Steel Industry Solution

Faced with similar problems in an industry that found a better solution than your industry has yet found, Roger M. Blough of U. S. Steel spoke on this subject in Los Angeles last February 1. Among other things he said in reference to competition, "There are right ways and there are ways not so right. One fallacious idea is thinking that indiscriminate and thoughtless price reduction to get volume, or for some other reason, without regard to cost is some kind of Father John's elixir—that it is a panacea for all business ills. Of course if a price reduction will increase total demand for a product and thereby improve your situation, well and good—but if the objective is to increase one's share of existing business it is well to consider whether any possible result will be momentary or lasting. Think for a moment what happens when you reduce prices indiscriminately — will

(Continued on page 51)

"Integration is fine if you don't surrender the needed profit of the converter in order to run a paper machine a few hours more, because obviously you're not going to run those extra few hours longer than it takes your competitor to do the same."

Langston Leader

LEADERSHIP BY DESIGN

JUNE, 1961 Published for information of paper and board mills by Samuel M. Langston Company, Camden 4, N.J. VOL. 3, NO. 3

HOW TO WIND BETTER ROLLS

Roll Density Controls Play Important Part In Determining Mechanical Quality of Roll

(Editor's Note: This is another in our series of technical articles on new developments to achieve the higher quality shipping rolls demanded by the stricter specifications of today's market.)

In these days of highly competitive markets, paper and board are more critically judged than ever before. In addition to inherent qualities in the product, such as brightness and tear strength on paper, and Mullen and caliper on board, the mechanical condition of the finished product also receives critical appraisal.

Such factors as absence of dust and lint, accuracy of slitting, straightness of sides, presence of welts, and roll density, all play a part in this determination.

The matter of roll density is what concerns us here.

The roll density desired, whether the product is paper or board, remains the same—namely, uniform density from the core to the outer periphery of the roll. To achieve uniform roll density, it is necessary to control certain elements in the winding operation. Here, however, the similarities end. The broad classifications of these materials have characteristic differences in their inherent qualities.

Characteristics Vary

With respect to paper (generally referring to bond, offset, catalog, mimeo and coated publication grades) we are dealing with sheets varying in characteristics of finish, density and resilience.

Generally, these grades range in weights from 50 to 70 lbs. per cubic foot—which means the sheet is relatively dense with a relatively small amount of resilience, this being dependent on furnish and finish, as supercalendering will produce extremes of density and inelasticity, particularly on ground wood filled sheets.

These grades then tend to develop very high roll weights. Since, in the winder, this weight is supported by two carrier drums, the weight is split into two components at the nip points. The higher this specific nip pressure becomes, the harder the roll becomes. Since the roll increases in weight as it gets larger in the winding operation, these nip pressures grow—and if this condition is uncompensated, the roll becomes increasingly hard which can result in roll damage due to "splitting" Nip pressure, therefore, becomes the first area to be controlled.

Importance of Large Drums

The specific nip pressure varies inversely as the diameter of the carrier drums, since basically with larger drums the weight load can be spread over a greater area. This, then, becomes the first characteristic required of a winder to do a job on these grades, namely—large diameter drums. Machines have been built with 25″ diameter drums in trim widths as narrow as 112″, in order to secure this favorable condition of low specific nip pressure.

Specific nip pressure is also affected by rider roll pressure. Action of the rider roll is essential at startup to ensure a firm core, but its value decreases with increasing paper roll weight. It becomes necessary therefore to compensate for this—accomplished on Langston winders by hydraulic, automatic compensation. As the rider roll goes higher with increasing roll diameter, its pressure is automatically and gradually reduced until the rider roll is exerting no downward force, thus serving to keep specific nip pressure uniform.

Further Relieving Weight

If it becomes desirable to wind increasingly larger diameter rolls, still further compensation must be made after the rider roll has ceased to exert a

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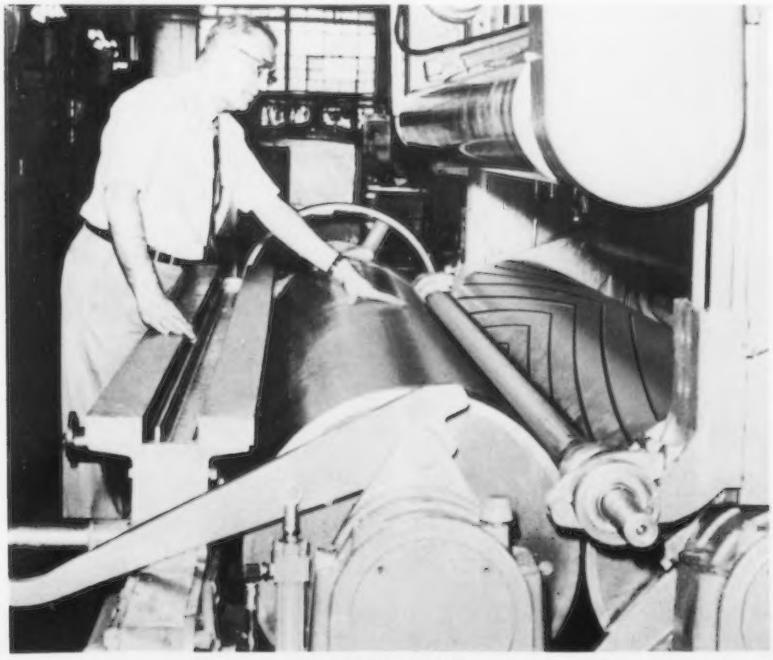


LARGER DRUMS

. . . spread the weight load

To Wind Better Rolls

(Continued from preceding page)

vided, and the gear ratio between drums must therefore be a compromise to suit numerous conditions.

- A single motor drive with cone pulley or vari-pitch sheave on the torque control drum is an improvement over the gear driven machine, since draw adjustment can be varied.
- A two-motor drive using a motor of the same horsepower on each drum permits a higher degree of draw control than any of the above. Due to an electrical load sharing tendency, however, complete draw control is not possible as the torque control drum will always be putting some draw on the roll. This drive is a distinct improvement, however, and is well suited for many applications.
- A Langston patented drive is the two-motor Torque Control Drive which employs two motors of *different* horsepower regulated to eliminate the load sharing tendency. Automatic controls reduce the draw as the roll of paper being wound increases in weight. This drive is suited for the most critical papers such as highly dense supercalendered coated publication grades. As utilized in the Speedmaster winder, the Torque Control Drive provides the greatest possible control of roll density.

The rider roll torque input influences to only a slight extent the density of the roll. It is important that this roll be driven, and its torque input must be variable—but if the other conditions spelled out above are not present, the rider roll effect becomes negligible.

Web Tension Systems

Another major factor influencing roll density is the web tension itself. Several systems of control are available depending on the application.

The simplest is a manual tension control system, where the operator adjusts the tension to suit the diminishing lever arm of the parent roll in an effort to keep the tension reasonably uniform. This system is suited for the simplest application where roll density is not critical, since it is at best a "hit-or-miss" system subject to the skill and attentiveness of the operator.

A more refined system employs constant tension control of various designs. This system can be initially set by the operator according to his judgment of the "correct" amount based on experience, and this tension will be maintained by automatic brake compensation throughout the winding operation. This system is preferable to the manual system for virtually all applications.

For Most Critical Grades

For the most critical grades a *tapered* tension system is employed. This automatically reduces the web tension as the winding operation progresses to compensate for the increasing rewound roll weight, as well as compensate for the reducing diameter of the unwinding roll.

Basically, the initial tension is set, as on the constant tension system, but this amount (let's say 4 lbs. per lineal inch of web initially) will automatically be reduced to an amount such as 2½ lbs. per inch at the completion of the winding operation. This system contributes a further degree of control over the roll density of extremely critical grades.

In summary, roll density is controlled by the following factors:

I. Paper roll nip pressure on drums
II. Draw control between drums
III. Web tension

These factors are determined and controlled on Langston Speedmaster winders as follows:

Factor I—Paper roll nip pressure on drums

Controls

a. Large diameter drums
b. Automatic rider roll weight compensation
c. Automatic rewind shaft lift

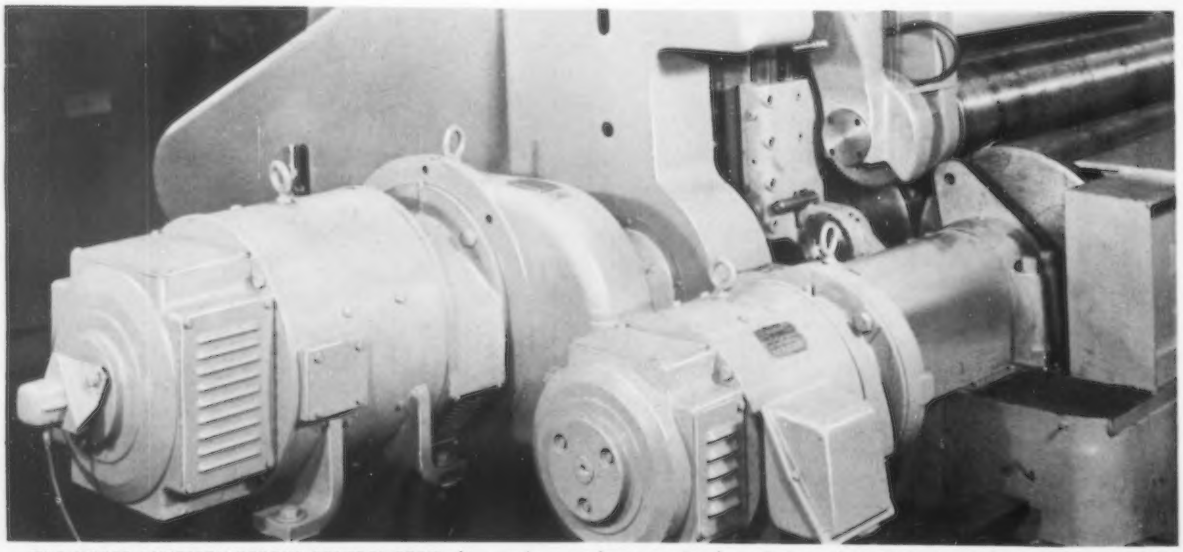
Factor II—Draw control

a. Thread-up between the drums
b. Automatic draw compensation by regulated two-motor drive

Factor III—Web tension

a. Tapered tension control.

The necessity of controlling these areas becomes obvious to those experienced in attempting to produce excellent quality large diameter shipping rolls of uniform roll density.



TWO-MOTOR LANGSTON TORQUE CONTROL DRIVE. Automatic controls are regulated to eliminate the load sharing tendency of the drums.

Looking for "Bugs"

in Huyck's Customer Service Department

These men are not entomologists. They are Huyck Customer Service Engineers studying a used felt. Looking for ways to make better felts is their job. They may check portions of this felt in our laboratory for chemical damage, type of plugging material or excessive wear, thus pinpointing causes for removal.

Such unique and complete services complement Huyck's advanced design engineering — further assurance that Huyck performance means High Performance on your machines.

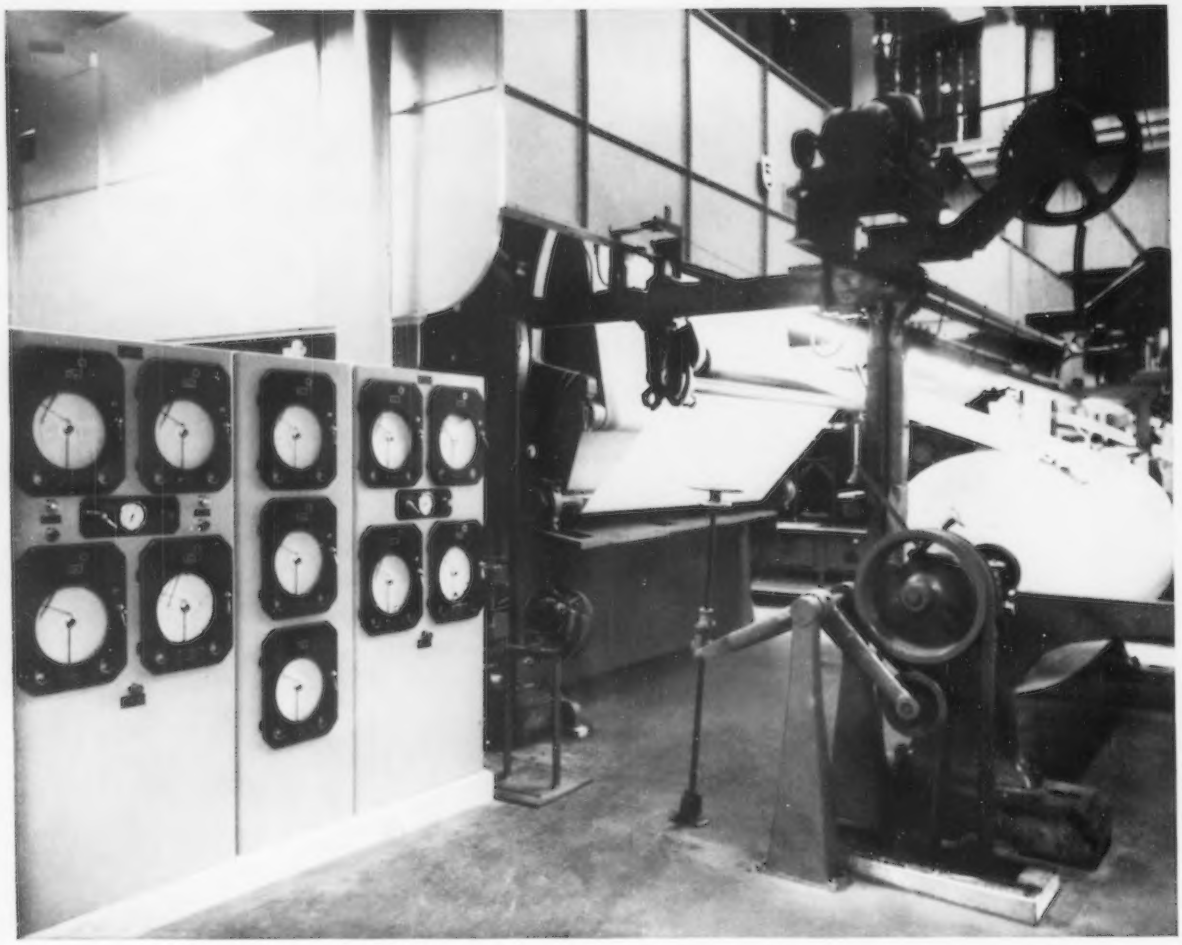
HUYCK FELTS

Huyck Felt Co., Rensselaer, N. Y.; Aliceville, Ala.

Division of Huyck Corporation

In Canada: Kenwood Mills Limited, Arnprior, Ontario

FIRST IN FELTS SINCE 1870



Taylor instrumentation for Stamm drainage and moisture control systems at Ecusta.

Ecusta equipping 3 more paper machines with this Taylor-controlled Stamm system!

Ecusta Paper Operations of Olin Mathieson Chemical Corp., Pisgah Forest, N. C., are so pleased with the Stamm Dryer Drainage and Moisture Control Systems recently installed on No. 5 machine that they have ordered three more.

No. 5 paper machine manufactures cigarette and other high grade specialty papers. Stamm moisture control systems are installed in the first and second dryer sections. They automatically reset the Taylor FULSCOPE* Recording Temperature Controllers individually controlling each dryer.

This Taylor-controlled Stamm system keeps shrinkage, cockle and curl to the absolute minimum, while maintaining the desired moisture in the sheet. The entire system is simple to operate and requires minimum maintenance.

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*Reg. U. S. Pat. Off.

Taylor Instruments MEAN ACCURACY FIRST

. . . Corrugated Box Business

(Continued from page 50)

your competition do the same and if you end up with the same proportion of the business you had before, you have mainly accomplished one thing, the weakening of your competitive position by turning a low profit enterprise into a lower profit enterprise, or a profitless one. This sort of thing can go on for only so long and then research, improvements and innovations are curtailed or never undertaken, customer service is reduced and the quality of the product suffers and ultimately, if carried far enough, the roof caves in and the business folds." This is not the right way to compete.

You should compete by continuing the contributions that have brought your industry to the prominence it rightly enjoys. You should compete by creating new container forms, by developing new ideas, by improving the already great merchandising techniques that you have incorporated into packaging. You should compete by combining new materials in new ways, by reducing weight, reducing cost, by any number of saving devices, all designed to serve the final consumer better, faster, cheaper and more attractively.

None of this is new. Nor would it be new (yet perhaps very constructive) to drop one important series of figures. Sometimes we have too many figures, too many facts. They dominate us. They make us do things that we inherently know are unwise.

Stop Reporting Capacities!

I urge your industry to give serious consideration to eliminating capacity figures and to stop reporting capacities. Did you ever hear any discussion of automobile capacity? Did it ever occur to anybody to think that General Motors ought to cut their prices because they were operating their plants at this, that, or the other per cent of capacity? Didn't one rather assume that General Motors could make and deliver however many automobiles they could sell and didn't one expect them to hold a good, fat profit margin except perhaps in extreme depression periods? Forget about capacity. Forget whether your industry is operating at 89 or 94 per cent. Think rather of your costs and the prices necessary to cover them with the profits that provide everything necessary for your continued sound growth.

But if your habits are too fixed or your inquisitiveness about capacity too great to permit this millstone to be lifted from your necks, then you would do well to heed General Clay's remarks of last February 21. Speaking to the Salesmen's Assn., of the paper industry, he commented on capacity as follows: "Realistically, some excess production capacity does not frighten me, as I am convinced our total productive capacity should always be ahead of demand, otherwise we should neither have the capacity to meet immediate growth, nor flexibility to provide the service which our customers have a right to expect. Perhaps, our industry enjoyed too many years in which demand was in excess of capacity and has thereby been governed by the intense desire to maintain full production, even though such a policy pursued by all leads to a chaotic market."

"Forget whether your industry is operating at 89 or 94%. Think rather of your costs and the prices necessary to cover them with the profits that provide everything necessary for continued sound growth."

As an investment man looks at your industry today his hopes, highly stimulated in the early post-war years, are still flickering, but his doubts are greater. He is beginning to refer to you as a cyclical industry, as often, perhaps more often, than he refers to you as a growth industry. There is still time but perhaps not very much while he waits to see whether you come out with the lady or with the tiger. If you choose the lady her name will probably be Dame Fortune—if you choose the tiger it will be no trained circus cat, but a devastating, up-setting, profit destroying, beast. Here at least is one investment man who hopes that you choose the lady.

Presented before the Fibre Box Assn. Spring Meeting at Fairmont Hotel, San Francisco, April 13, 1961.

Weyerhaeuser Finds Numerous Advantages in "Avistrap" Cord

Ease of handling and light weight are two of the key advantages resulting from the use of rayon cord strapping on unitized shipments. A typical application may be found at the Shipping Container Division of Weyerhaeuser Co. in one of its Eastern Region Plants at Delair, N. J.

Weyerhaeuser's Shipping Container Division makes containers of solid fiber or corrugated material for some of the largest organizations in the nation. These include firms in the field of foods, petroleum, electrical parts, small appliances, explosives, paper and textile fibers.

Weyerhaeuser ships units of containers weighing up to 1,000 lbs. with Avistrap and finds the new strapping easy to handle and that corner protectors may be eliminated. The firm also likes the fact that there is no cutting of the edges of the knocked-down containers when the rayon strapping is used, and that Avistrap is safe, since there are no jagged edges and the material does not snap and cause injuries to personnel.

Special and continuous quality control procedures are carried out to insure uniform standards of all containers. Weyerhaeuser finds it necessary to seek constant improvement of material handling techniques to eliminate damage to containers during shipment. Accordingly, the super-strength rayon of Avistrap, a new product of the Industrial Packaging Department of American Viscose Corp., is of major interest and increasing usage.

Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures
(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Apr. 22	Apr. 29	May 6	May 13	May 20
1961	92.2r	89.9r	91.9r	91.6r	92.5
	Apr. 23	Apr. 30	May 7	May 14	May 21
1960	94.4	99.4	97.3	98.5	97.8

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	96.5	97.7	98.1	96.9	97.6	96.1	81.2	91.7	89.1	94.8	92.0	80.2	92.7
1960	87.9	90.0	91.2	90.7‡									

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1954	1955	1956	1957	1958	1959	1960	1961
Year to Date	93.8	97.0	101.5	95.2	88.5	92.2	97.4	90.2
Year Average	91.6	96.2	97.9	90.4	87.0	92.2	92.7	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

PAPERBOARD OPERATING RATIOS†—National Paperboard Assn. Figures

COMPARATIVE WEEKLY SUMMARIES

	Apr. 22	Apr. 29	May 6	May 13	May 20
1961	92	91	93	92	93
	Apr. 23	Apr. 30	May 7	May 14	May 21
1960	86	92	93	94	95

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	92	95	94	93	94	92	78	94	88	93	86	73	89
1961	88	89	91	91									

† *Per cents of operation based on "inch-hours" reported on a 6-day basis to the National Paperboard Association.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	WEEK ENDING May 13, 1961	WEEK ENDING May 20, 1961	CUMULATIVE TO DATE Jan. 1, 1961 to May 20, 1961
% Activity	92%	93%	90%
Total	319,615	324,167	6,153,212
Containerboard—Domestic Use	165,197	161,309	3,102,705
Liner	112,437	104,586	2,057,406
Corrugating Material	47,904	50,868	946,527
Chip & Filler Board	4,856	5,855	98,772
Boxboard—Domestic Use	98,673	104,163	1,939,787
Folding	56,857	62,793	1,144,309
Set-Up	9,366	10,366	189,177
Special Food Board	32,650	31,004	606,301
Other Paperboard	55,745	58,695	1,110,720
Containerboard Type	23,788	27,131	527,335
Boxboard Type	31,957	31,564	583,385
Total Orders			
Received	308,698	303,563	
Unfilled End of Week	456,332	436,539	

PJT NEW LITERATURE

Blanket to Blanket Web Offset Perfecting Presses

Discusses in simple non-technical language how web offset perfecting presses work, their advantage and disadvantages, and their place in the industry. Profusely illustrated with photographs and diagrams and contains an informative glossary of terms. The booklet is a basic text for anyone who wants to know more about the process and its place in his future. The Miehle Co., 2011 Hastings St., Chicago 8, Ill.

Questions and Answers About Valving

Details demand made on valves and their function in a compressor. Cartoons and cut-away drawings are used to illustrate valve components and mechanics. Booklet (Form 3222). Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

Product and Service Brochure

Illustrates several types of equipment fabricated of stainless steel for various firms throughout the U. S. The engineering services available to industry are outlined and some of the modern fabricating equipment used by Portland is illustrated. Brochure. John B. Alden, Portland Copper & Tank Works, Inc., 80 Second St., South Portland, Me.

Total Acidity IV General Description

Details a means by which, with the addition of a suitable buffer, only slight changes in indicator color are given, instead of the usual sharp, complete change. Includes flow diagram and actual chart recordings. 2 pp. Data Sheet. Technicon Controls, Inc., Research Park, Chauncey, N. Y.

MORDEN NO. 6 REFINER, 150 H.P.
MORDEN BIG NO. 8 REFINER, 300-400 H.P.

The Stock-Maker Refiner's unique reverse-flow cushioning treatment provides good mullen, minimum freeness drop, good tear retention. Morden reverse flow holds a cushion of stock between shell and rotor bars, permitting gentle brushing, combing and fraying of the fibers. Customers report power savings up to 50%. **Detailed information upon request.**

MORDEN STUFF-MAKER JORDAN

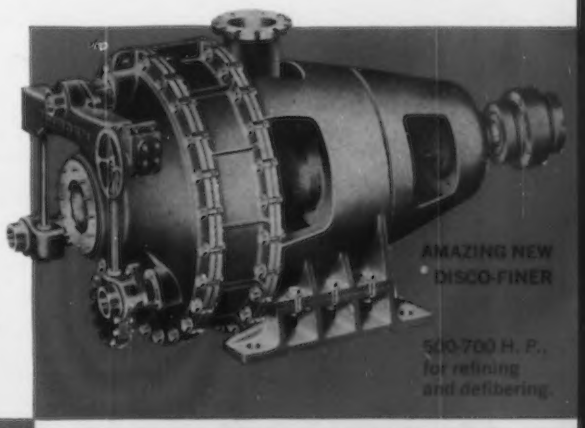
The Morden Stuff-Maker for jordaning represents a real technical advance in Jordan engines. In place of conventional rolled bar fillings, Morden provides precision cast, dynamically balanced fillings which require no grinding in. Technically advanced Morden fillings substantially improve treatment, give service far in excess of conventional rolled bar fillings. **Complete information supplied upon request.**

BIG NO. 8 REFINER
300 to 400 H.P., for beating. Simple flow and filling changes convert this machine into the Morden Stuff-Maker Jordan.

better stock treatment • lower power consumption • greater production • MORDEN accomplishes all three

MORDEN DISCO-FINER, 500-700 H.P.

The most significant new development in stock preparation, the NEW MORDEN DISCO-FINER, provides (a) Tremendous capacity, (b) Low power consumption per ton of production. Simple flow and filling changes adapt the Disco-Finer for defibering or refining. The new self-aligning, semi-conical design of rotor and stator plates overcomes possibility of warpage or deflection. Here, truly, is the answer where large production and high precision treatment are required. **Complete information upon request.**



AMAZING NEW DISCO-FINER
500-700 H. P., for refining and defibering.

MORDEN SLUSH-MAKER PULPER

CONTINUOUS OR BATCH OPERATION

Regardless of your pulping requirements, there just is no better answer than the Morden Slush-Maker Pulper. It can be employed on continuous or batch operation. Can be mounted beneath the paper machine to handle dry-end broke on a continuous basis at full machine production. Rapid circulation and the unique Morden brushing action give the most thorough repulping. Even where the job is toughest, where space is limited, the Morden Slush-Maker handles pulp sheets, paper stock, coated and uncoated brokes and completely defibers difficult wet-strength brokes. **Write for full story.**

SLUSH-MAKER PULPER
continuous dry-end pulping.

SLUSH-MAKER PULPER
Batch or continuous pulping.

MORDEN
MACHINES COMPANY

3420 S. W. MACADAM AVENUE
PORTLAND 1, OREGON
TELEPHONE: CApitol 2-9355 • CABLE "MORDEN"

STRENGTH CURVE REFINING IN MINUTES ...NOT HOURS

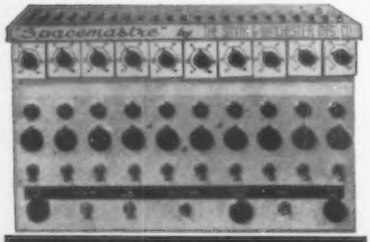
Using the Bauer-Mead Laboratory Refiner, you can get accurately reproducible data in only a fraction of the time required by other equipment.

For details and bulletin, write or call us. FAirfax 3-5501.

The Bauer Bros. Co.

HEADQUARTERS FOR PROGRESS

1758 Sheridan Ave. • Springfield, Ohio



NOW! SMITH & WINCHESTER WILL AUTOMATE THE BACKGAUGE MOVEMENT OF YOUR EXISTING TRIMMERS WITH

Spacemastre

THE ELECTRONIC BACKGAUGE CONTROL

- Increase production, lower operating costs with accelerated trim cycle.
- Automatic electronic settings assure greater accuracy. TV type knobs simplify dimensional changes.
- Spacemastre *protects your present investment.* Your trimmers need not become obsolete!
- Spacemastre can be installed on any width or length guillotine type trimmer that has a screw operated backgauge . . . will pay for itself in a very short time.

LEARN ALL THE FACTS! Write for bulletin 6S. Dept. PJ

SMITH & WINCHESTER
South Windham, Conn.

SMITH & WINCHESTER — SPECIALISTS IN SHEETING AND CUTTING EQUIPMENT

Prices of Fibers

MARKET WOOD PULP

SECOND QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

Delivered Basis

	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$82.50/ 90.00	$82.50/ 90.00	$90.00/ —	$90.00/ —	$90.00/ —
Bleached Gw'd.	97.50/100.00	97.50/100.00			
Kraft, Blchd.	‡140.00/150.00	‡140.00/150.00	150.00/ —	150.00/ —	150.00/ —
Kraft, Blchd. Hdwd.	135.00/140.00		140.00/ —		
Kraft, Semi-bleached.	130.00/140.00				
Kraft, Unbl.	117.50/125.00	125.00/ —	125.00/130.00	125.00/ —	
Sulphite, Blchd.	‡135.00/140.00	‡135.00/140.00	140.00/ —	140.00/ —	140.00/ —
Sulphite, Bl. Hdwd.	135.00/ —				
Sulphite, Unblchd.	125.00/ —	125.00/ —	125.00/ —	125.00/ —	125.00/ —
Sulphite, Unb'l. Gl'an.		140.00/ —	134.00/ —		
Soda, Blchd.	130.00/135.00	130.00/135.00			

‡ Depending on Brightness.

COTTON LINTERS

F.O.B. OIL MILLS PER CWT
WEEK ENDED MAY 23

	Atlanta	Memphis	Dallas	Los Angeles
Grade 1	n.a.	n.a.	n.a.	n.a.
2	n.a.	n.a.	n.a.	7.50/7.00
3	$7.50/7.00	$7.50/7.25	$7.50/7.00	6.75/6.50
4	7.00/6.25	6.50/6.25	6.50/6.25	6.00/5.75
5	6.25/5.75	6.00/5.75	6.00/5.50	5.25/4.75
6	5.75/4.75	5.50/5.25	5.25/5.00	4.50/4.25
7	4.75/4.25	4.75/4.50	4.75/4.00	n.a.

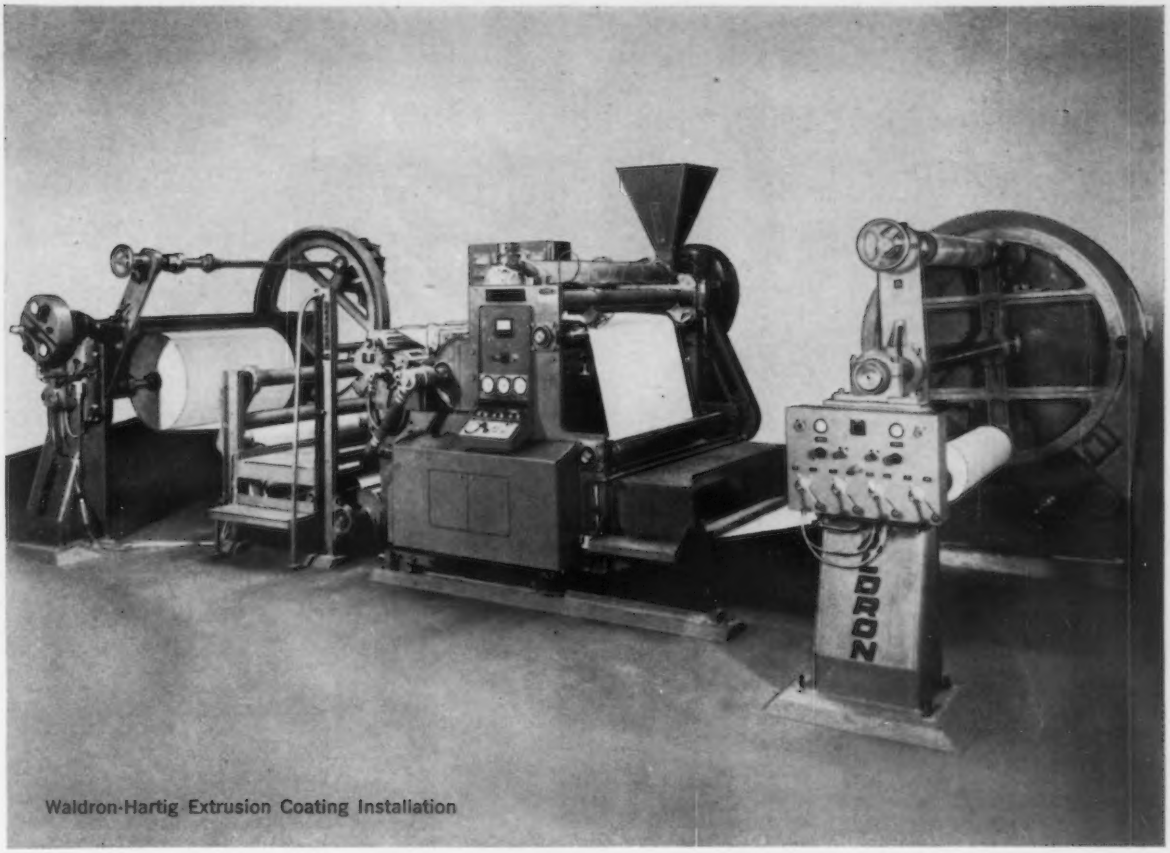
WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers and brokers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York	Boston	Chicago	Los Angeles
	May 29	May 29	May	May
No. 1 Mixed Paper	$ 7.00/ 9.00	4.00/ 7.00	6.00/ —	12.00/ —
No. 1 News	12.00/ 13.00	11.00/ —	11.00/ —	16.00/ —
Overissue News (Lg. size)	11.00/ 13.00	9.00/ 11.00	16.00/ —	18.00/ —
Mill Wrappers	19.00/ 22.00	9.00/ 11.00	9.00/ —	13.00/ —
Old Corrugated Containers	17.00/ 18.00	15.00/ 15.50	18.00/ —	16.00/ —
Super Resorted Kraft Paper	35.00/ 40.00	— / —	28.00/ —	50.00/ —
New Double Kr. Ld. Corr. Cuts	27.50/ 30.00	30.00/ 32.50	30.00/ —	27.50/ —
(Semi-chem. medium)	45.00/ —	42.50/ —	42.50/ —	— / —
New 100% Kraft Corr. Cuts	40.00/ 42.50	— / —	52.50/ —	— / —
New Br. Kraft, Env. Cuts	65.00/ 70.00	65.00/ 70.00	47.50/ —	45.00/ —
New Br. Kr. Bag Waste Prntd.	50.00/ 55.00	50.00/ 60.00	47.50/ —	35.00/ —
New Br. Kr. Bag Waste Unprintd.	55.00/ 60.00	60.00/ 65.00	55.00/ —	42.50/ —
No. 1 Groundwood Shvs.	25.00/ 30.00	20.00/ 25.00	10.00/ —	27.50/ 30.00
White Newsblanks	42.50/ 45.00	35.00/ 40.00	30.00/ —	55.00/ —
No. 1 Soft White Shvs.	55.00/ 60.00	55.00/ 60.00	50.00/ —	75.00/ —
Super Soft White Shvs.	65.00/ 75.00	70.00/ 80.00	60.00/ —	— / —
Hd. White Shvs.	75.00/ 80.00	80.00/ 90.00	75.00/ —	80.00/ —
Hd. White Env. Cuts	90.00/ 95.00	100.00/105.00	80.00/ —	103.00/ —
Col. Tab. Cards	40.00/ 42.50	40.00/ 42.50	40.00/ —	35.00/ —
Manila Tab. Cards	57.50/ 60.00	55.00/ 60.00	60.00/ —	65.00/ —
No. 1 Col. Ledger	32.50/ 35.00	30.00/ 35.00	35.00/ —	18.00/ —
White Ledger	45.00/ 50.00	42.00/ 47.00	45.00/ —	40.00/ —
Mixed Book & Mag.†	— / —	— / —	8.00/ —	— / —
No. 1 Books‡	15.00/ 17.50	18.00/ 22.00	22.50/ —	8.00/ —

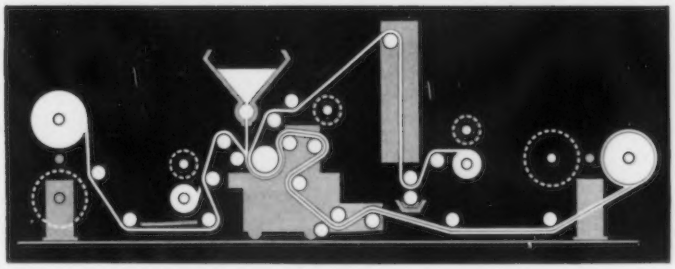
† Includes Time & Life: no coarse groundwood. ‡ Not to exceed 10% of groundwood.



Waldron-Hartig Extrusion Coating Installation

Integrated web process systems

for Coating, Laminating & Casting



A complete line of standard unwinds, winds, coaters, laminators, embossers, extruders and ovens are especially combined for your converting process needs —proven units of the latest design!

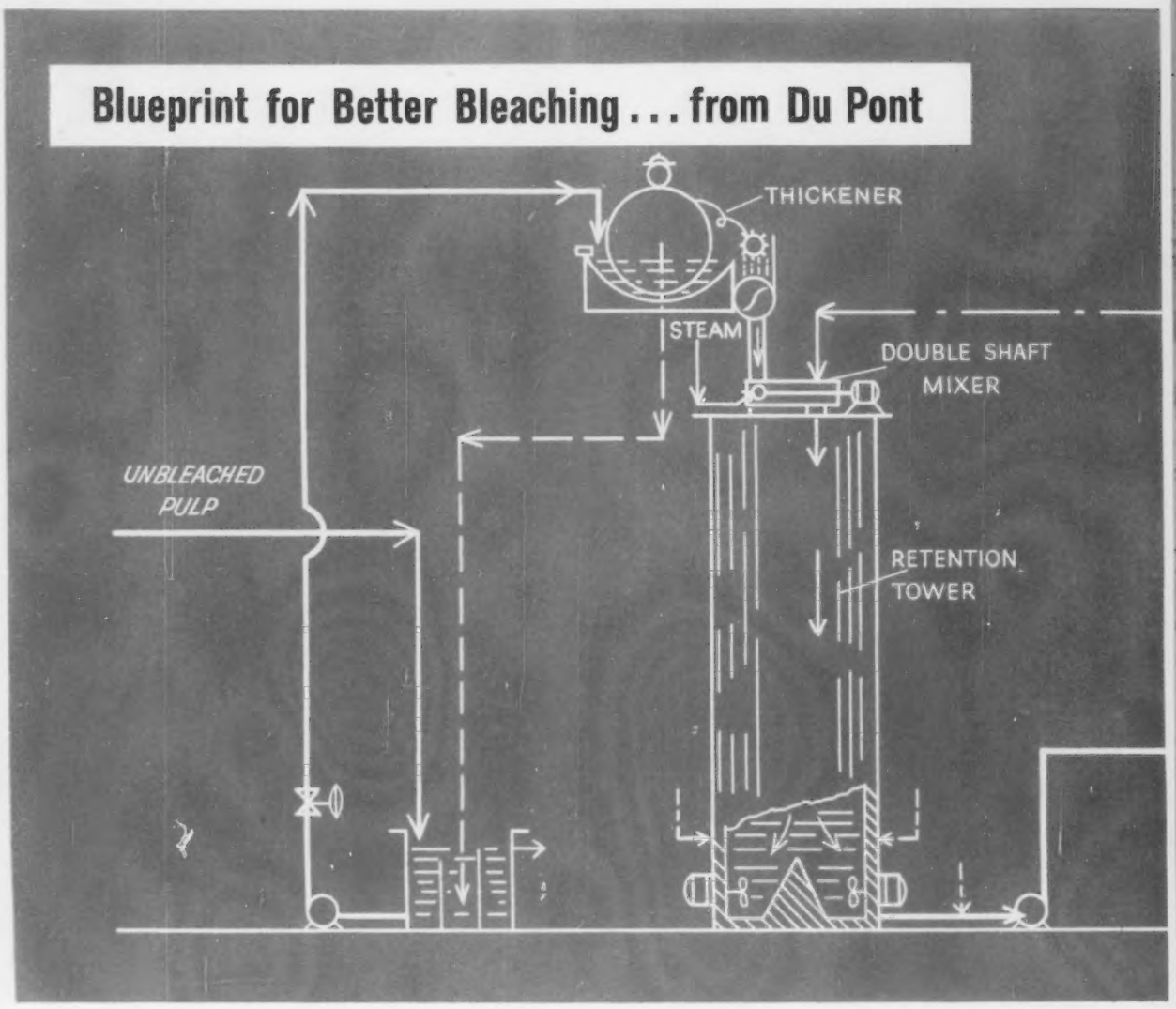
Waldron-Hartig provides complete project responsibility. Qualified representatives are available to discuss your needs. Write for information.

WALDRON-HARTIG

technical competence in web process machinery

WALDRON-HARTIG, Box 791, New Brunswick, N. J./a division of Midland-Ross Corporation MR

Blueprint for Better Bleaching . . . from Du Pont



This is a single-stage, medium-density system. It uses a combination of hydrogen peroxide

How you can use a combination of Du Pont

To meet today's demand for higher brightness in groundwood paper, Du Pont suggests that you investigate the advantages of a peroxide bleaching system such as the one shown above.

This single-stage, medium-density system uses a combination of hydrogen peroxide and sodium peroxide to make possible groundwood or cold soda pulp brightnesses in the 70-80 brightness range. This means you can produce paper with higher brightness and inherently good printing qualities. Simply by varying the amount of peroxide applied in the above system, the pulp brightness can be readily varied over a wide range as follows:

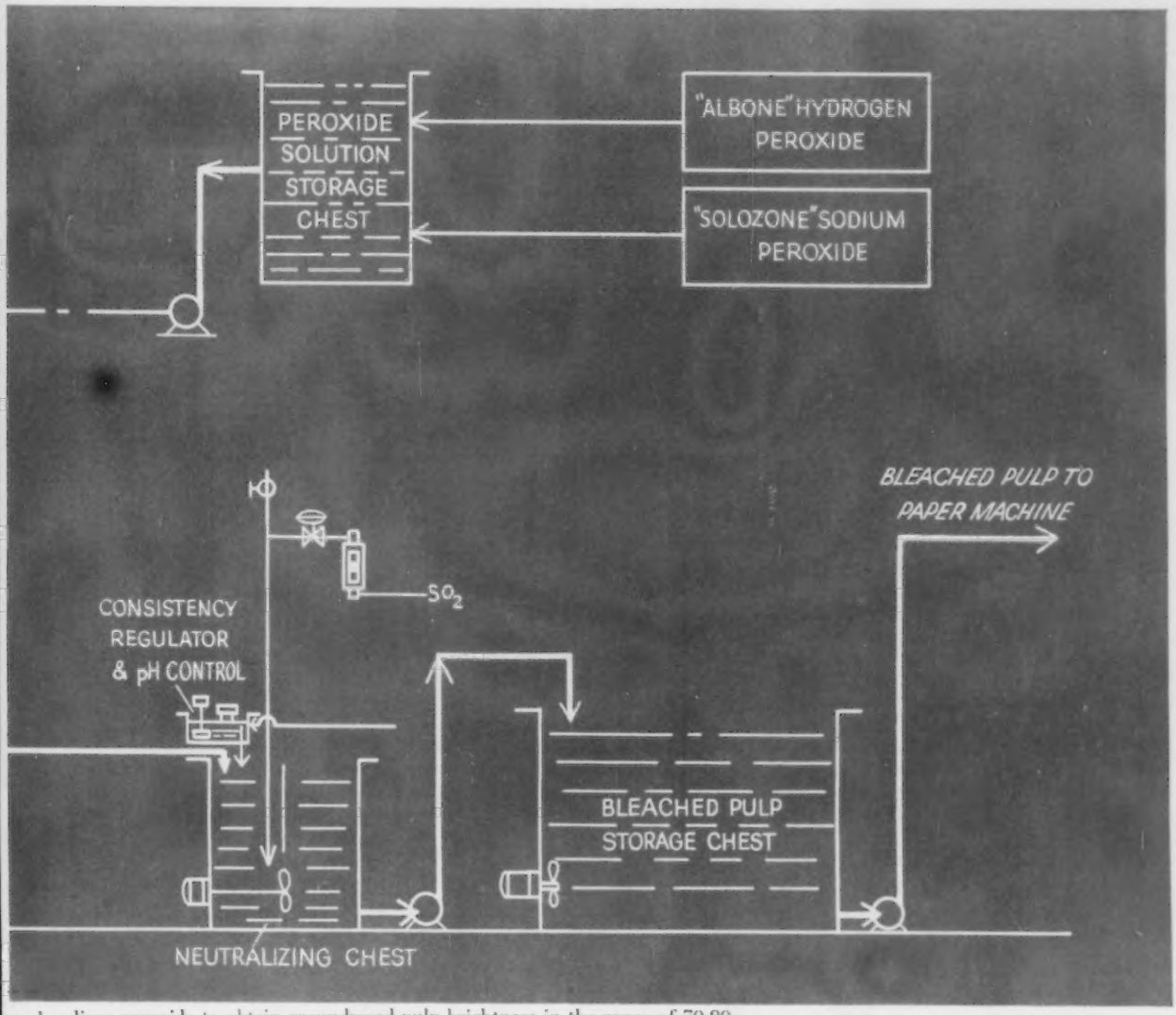
GROUNDWOOD SPECIES	
Spruce-Balsam	(60-63 Unbleached)
Poplar	(63-66 Unbleached)
Southern Pine	(57-59 Unbleached)

CONTACT ONE OF THESE MEN FOR INFORMATION:

Midwest Area
W. L. Liike, Chicago, Ill.—INdependence 3-7250

New York & Boston Area
C. R. Lombard, New York, N. Y.—LOngacre 3-6440

Or call: N. J. Stalter, Wilmington, Del.—PRospect 4-4698



and sodium peroxide to obtain groundwood pulp brightness in the range of 70-80.

Peroxides to increase groundwood brightness

Your Du Pont technical representative will be glad to provide you with further information on peroxide bleaching of all types of pulp... suggest process layouts to fit your present plant operation. He can bring you the benefit of Du Pont's 25 years' experience in providing peroxide pulp bleaching processes—over 50 years as a major producer of both hydrogen and sodium peroxides. Contact your nearest representative listed below, or write: Du Pont, Electrochemicals Department, Wilmington 98, Delaware.

BLEACHED PULP BRIGHTNESS

1% Sodium Peroxide Equivalent	2% Sodium Peroxide Equivalent	3% Sodium Peroxide Equivalent
66-69	70-72	73-77
69-72	73-77	76-80
62-64	66-68	70-71

West Coast Area
P. E. Kiefer, Portland, Oregon—CApital 7-1281

Southern Area
R. W. Hammond, Charlotte, N. C.—FRanklin 5-5561

DU PONT PEROXIDES

ALBONE® hydrogen peroxide

DU PONT

SOLOZONE® sodium peroxide

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

PJT NEWS OF SUPPLIERS

W. Stubblebine

M. W. Johnson

Stowe-Woodward, Inc., Newton Upper Falls, Mass., has promoted Warren Stubblebine to the position of sales manager—Roll Division.

Formerly director of research and development for the company, Dr. Stubblebine will now have responsibility for both domestic and international sales as well as all technical services.

During the past 20 years Dr. Stubblebine has been active in the sales and technical development phases of the rubber industry.

Wheeler Roll Co. has advanced M. W. Johnson to the position of president, a vacancy created by the death of former president Ward Wheeler. The firm is manufacturer of pilot paper machines, coating machines and supercalenders.

Foxboro Co., Foxboro, Mass., has announced plans to acquire the assets of Waugh Engineering Co. of Van Nuys, Calif., manufacturer of electro-mechanical and electronic instruments, in exchange for 12,806 shares of its common stock. The firm will be operated as a division of Foxboro and will continue under the direction if its founder, Charles C. Waugh. No changes in personnel are anticipated.

In announcing the signing of a purchase agreement, R. A. Bristol, Foxboro executive vice president, emphasized that Waugh products—particularly its turbine flow meters—are an important addition to the extensive Foxboro line of measuring and controlling instruments for the process industries.

American Cyanamid Co.'s Pigments Division, has appointed Philip G. Sutton Jr., a sales representative. He has been assigned to the Boston office.

A native of New Albany, Ind., Mr. Sutton attended Western Michigan University and was graduated from Purdue University in 1958 with a bachelor's degree in chemical engineering.

P. G. Sutton Jr.

R. B. Anderson

V. B. Jensen

D. P. Jones

Nopco Chemical Co., Newark, N. J., has named Richard B. Anderson a sales representative in six southern states for the Industrial Division.

Mr. Anderson will handle sales of all Industrial Division products, although specializing in textile chemicals, in South Carolina, Georgia, Alabama, Tennessee, Mississippi and Arkansas.

Cleveland Crane & Engineering Co., Wickliffe, Ohio, has appointed Vernon B. Jensen district manager for the Cleveland Tramrail and Steelweld Machinery Divisions in the Cleveland, Toledo and Detroit areas. Mr. Jensen previously was with the Cleveland Tramrail distributor organization in San Francisco, Calif., as sales and project engineer for Cleveland Tramrail cranes and monorail systems.

Southworth Machine Co., manufacturer of equipment for the paper mill and materials handling industries, announces the appointment of Donald P. Jones, Simsbury, Conn., as

THERE'S A RIGHT WAY TO HANDLE H_2O_2, TOO!

fmc FOOD MACHINERY AND CHEMICAL CORPORATION

Becco Chemical Division

Becco engineers are specialists in Hydrogen Peroxide...and in the best ways of handling it. Let us put our fourfold service—offering survey, proposal, installation and inspection—to work for you now. It's your assurance of savings, safety and convenience.

161 East 42nd Street, New York City

its Eastern sales manager.

Mr. Jones' responsibilities include sales, engineering service consultation, and product development work for the company's three divisions . . . bindery and allied equipment for the printing industry; finishing room systems and equipment for the paper industry; and lifting, feeding and work positioning devices for use at a variety of production machines.

Carl N. Beetle Plastics Corp. is now engaged in the manufacture and sale of hoods for paper machines. This business was formerly conducted by Mead Pulp Sales, Inc., New York, N. Y.

Under the new arrangement, the facilities of Mead Pulp Sales, Inc., of which Nelson S. Mead is president, will be actively identified with the distribution and sales promotion of Beetle Plastic's hoods. Mead Pulp Sales, Inc., a wholly owned subsidiary of the Mead Paper Corp., also maintains offices in Chicago, Ill., and Dayton, Ohio. George H. Cash, formerly with Mead Pulp Sales, Inc., is now associated with Beetle Plastics and is responsible for the sale of hoods for paper machines with offices at 77 Bedford Street, Stamford, Conn.

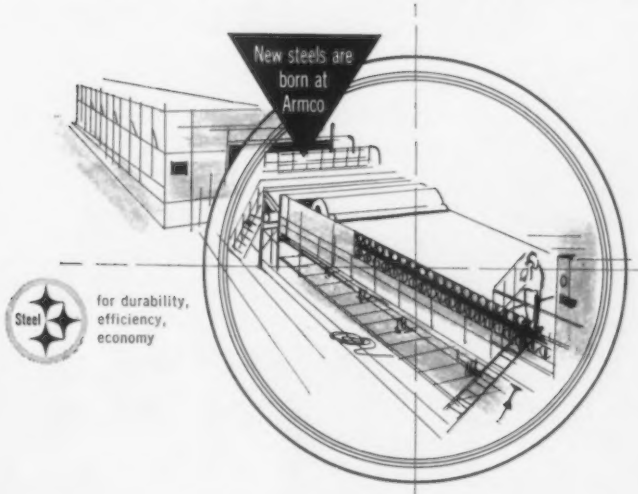
As manufactured by Beetle Plastics, a wholly owned subsidiary of the Crompton & Knowles Corp., the corrosion-proof plastic hoods have application as covers for paper machines for purposes of ventilation and steam removal. They are also maintenance free and rustproof, and eliminate paper staining.

HUYCK FELT CO sales manager, Paul G. Mansuy, congratulates George Stull, (production supervisor of Riegel Paper Co.'s Hughesville mill) center, as the 500th papermaker to graduate from the Huyck Felt Co. Workshop. Looking on is Frederic A. Soderberg, general manager, Huyck Felt Co. Mr. Stull was presented with a Kenwood blanket.

Dewey and Almy Chemical Division, W. R. Grace & Co., Cambridge, Mass., has named William C. Capehart of Houston Tex., as field sales representative for the Organic Chemicals Division.

Mr. Capehart will be responsible for sales of Dewey and Almy's

For Machine Furnish, White Water, Vacuum, Steam Systems...



Armco can meet your Paper Machine Pipe Needs

Armco Welded Steel Pipe is supplied pre-fabricated, with every bend and coupling, to meet your *exact* system specifications. Here's how ready-to-install Armco Pipe Systems help save money.

Installation time is sharply reduced, and your systems have a minimum of flanged couplings to maintain. Smooth pipe interiors increase the efficiency of your operation and quality of your products.

For price, technical and installation data, write Armco Drainage & Metal Products, Inc., 5211 Curtis Street, Middletown, Ohio, without cost or obligation.

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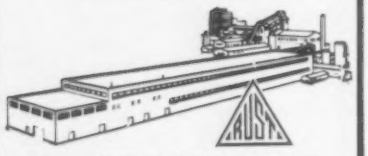
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PITTSBURGH • BIRMINGHAM

vinyl acetate polymer and copolymer emulsions, butadiene styrene resins and latexes, vinylidene chloride polymer, plasticizers and dispersing agents in the states of Texas, Oklahoma, Arkansas, Mississippi, Louisiana and Western Tennessee.

Cadillac Associates Inc., Chicago, Ill., has named W. M. Ryan an executive counsellor in the paper industries division.

For Mr. Ryan it is a case of "like sons, like father." Both his sons were in the paper field before he entered it —William III with St. Regis in New York and Alan with International in California.

Laporte Titanium, Ltd., has moved its Technical Service Department to its new premises at 28 Milton Road, Harpenden, Herts., England, on June 1.

Penick & Ford, Ltd., has announced the appointment of Ernest C. Cowell as paper mill representative. for the Corn Refining Division. Mr. Cowell will call on paper mills in the Central District. He joined the company in February 1961 with experience in quality control, research engineering and customer service

E. C. Cowell

J. M. Norlin

work for manufacturers of paper and paper board.

A Korean War veteran, Mr. Cowell holds a B.S. in chemistry from the University of Michigan and a B.S. in pulp and paper technology from Western Michigan University.

W. S. Tyler Co., producer of paper mill wire cloth and screening machinery, has named Jack M. Norlin manager, paper mill sales. Among the products for which Mr. Norlin will be responsible is Ty-Flex, the new stainless steel fourdrinier wire recently introduced by W. S. Tyler.

Mr. Norlin, a graduate of Case Institute of Technology, has been with W. S. Tyler since 1949, serving as southern sales representative, and paper industry specialist in the Cleveland main office.

OBITUARIES

John H. S. MacDonald, vice president of the Bowater Paper Co., Inc., New York, died in New Rochelle Hospital on May 19 after a brief illness.

Henry Grant Steinson died May 10 in his home. Mr. Steinson retired in 1956 as president of the American Envelope Co., Chicago, Ill.

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Becco Chemical Division
101 East 42nd Street, New York City
Why not let Becco suggest the best handling system for your particular needs? With its four-fold engineering service, Becco—most experienced producer of H_2O_2—can serve you well. Including survey, proposal, installation and inspection.

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FOR ALL PAPER MAKING PURPOSES

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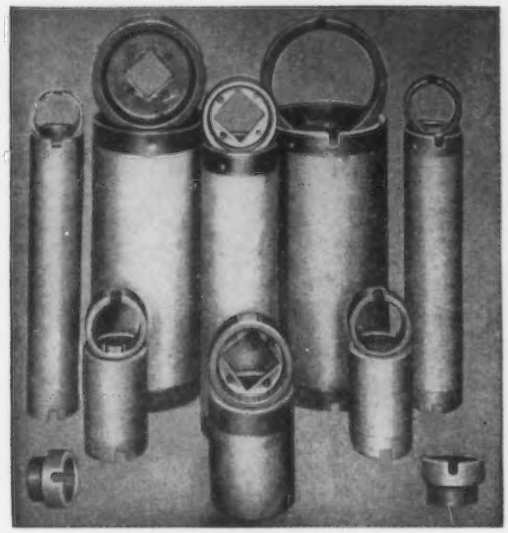

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Straight wound paper cores made in sizes from 2" to 10" inside diameter with any thickness wall required.

Long draw protected slot caps of heavy gauge steel in all standard sizes.

Heavy duty caps with reenforced square hole. This patented feature of reenforcement gives added strength and durability.

Samples of caps or cores will be gladly submitted

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High Speed Disc Refiner

THE BAHR BROTHERS MFG. CO.

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Paper men ourselves, and the only recognized professional specialists in the world in our particular field, we assist responsible paper men to accelerate their careers by uncovering and developing THE SPECIFIC SITUATION that most exactly fits the needs of each individual we serve.

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Required by the SANDWELL ORGANIZATION

Experience Desired in the Design, Operation and Construction of Pulp and Paper Mills and Steam Power Plants.

Projects offer opportunities for both domestic and foreign assignments.

Openings are available at both Senior and Junior levels.

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or to:

SANDWELL AND COMPANY LIMITED
1500 Alberni Street
Vancouver 5, Canada

Interviews will be arranged.
All replies will be treated in confidence.

J-9

DEVELOPMENT CHEMIST/ENGINEER

with papercoating, papermaking background. To join expanding staff specializing in silicones for paper industry. Opportunities good. Salary commensurate with experience. Write or send resume to Bruce W. Ringey, Salaried Employment, Dow Corning Corporation, Midland, Michigan. J-19

Help Wanted

SALES REPRESENTATIVES (2)

If you are interested in selling colors and chemicals to the paper and textile industries, we want to talk with you about a position on our sales staff.

Experience in this type of work would be a plus value, but most important is knowledge of the field and a strong desire to sell.

We offer salary, incentive and an excellent benefit program.

If you are interested, contact T. F. O'Brien.

SANDOZ, INC.
61 Van Dam St., New York 13, N. Y.

J-12

Help Wanted

Midwest Pulp and Paper Mill is seeking an experienced **supervisor** to handle the entire finishing and shipping area. Must have experience in sheeter, rewinder and trimmer operation on high-grade boards. All replies will be considered confidential. Send resume including education, experience and salary requirements to Box 61-116 care Paper Trade Journal. J-2

BAG MACHINE TENDER wanted. Experienced in notion and millinery. Plant in Brooklyn. Address Box 61-115 care Paper Trade Journal. J-5

. . . WANTED Ph. D. . . .

With Strong Background In Pulp And Paper Technology As

ASSISTANT DIRECTOR R. & D.

TO $18,000 START

Plus Profit Sharing Bonus

Client company, a large, very successful and continuously expanding fully integrated coarse specialty mill and converting operation in the South with branch plants throughout the U.S., in Canada and Europe, seeks an outstanding scientific administrator to understudy and in two years replace its incumbent Chief Chemist and Director of Research and Development, now 63.

Man selected will be a Ph.D. in Chemistry, Chemical Engineering or Pulp and Paper Technology, 35 to 50, with a proven capacity for leadership in administering and coordinating technical activities. After proper indoctrination, he will assume full direction of and responsibility for the chemical research and development efforts of 15 chemists, 9 technicians, 1 chemical production supervisor and 5 helpers, working on paper and paper products. Research area covers pulp and paper production, phenol-formaldehyde resins, plastics, adhesives, lacquers, paints and the recovery of organic chemicals from pulping liquors. Considerable of the work will be in developing new products and seeing them into production, as well as the improvement of products already in production, and the processes by which they are manufactured.

Client company's main offices are located in a very desirable Southern section. Adjacent is a beautiful, brand new ultra modern chemical laboratory, chockfull of the latest and finest scientific instruments and equipment. Overall corporate climate is ideal. Technical activities are a major factor in top management thinking. The Director of Research and Development is a member of the 10-man Executive Committee and, as such, shares in the very substantial executive profit sharing bonus.

Make inquiry by duplicate letter to Mr. George M. Sunday personally in full confidence, enclosing two pictures and two copies of comprehensive resume covering vital statistics; education; social, religious and professional affiliations; and chronological treatment of business background and experience, including present and past salaries. Telephone conference will follow, at which time cogent details will be revealed, descriptive literature forwarded and arrangements made for initial, exploratory interview with client principals.

This is a top job for a top man with a top company, world renowned in its field, and, to the right man, opportunity for both personal and financial growth is virtually unlimited. We strongly recommend that any qualified scientist reading this copy give the possibility his most serious attention.

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Pulp, Paper, Packaging and Allied Industries

6 East Monroe Street Chicago 3, Ill. ANdover 3-1970

J-5

FOR SALE

FOR SALE

FOR SALE

BEATERS

2—1500 lb. rag beaters, Valley Iron, bandless rolls, 54″ x 48″, cast iron tubs

CALENDER STACKS

1—3 roll 84″ face
1—4 roll 72″ face (Extra heavy duty)
1—5 roll 86″ face

CHIPPERS

1—96″ Murray 4 knife Chipper—anti-friction bearings
1—84″ 10 knife Carthage Chipper, Anti-friction bearings, with motor

COATERS

1—27″ High Solid Coater
1—42″ Chapman Extrusion Type Coater

CRUSHER & HAMMERMILL

1—Murray Chip Crusher
1—Williams Hammermill
1—Jeffrey Shredder

CYLINDER MOLDS

5—36″ diameter x 75″ face, with couch rolls
1—36″ diameter x 82″ face
1—42″ diameter x 96″ face
2—42″ diameter x 106″ face
2—60″ diameter x 170″ face

DRIVES

1—Jones 21 H.P., ratio 10 to 1 (enclosed angle drive)
1—#4 Reeves Drive
2—Falk Drives, 20 H.P. & 160 H.P.
4—Falk Chest Agitator Drives, 10 H.P., ratio 140 to 1.

DRYERS

1—16″ diameter x 54″ face (steel)
1—28″ diameter x 84″ face
1—28″ diameter x 48″ face
4—28″ diameter x 40″ face.
2—Calender Dryers, bronze, 30″ x 128″ with frames, gears & necessary rolls to make up the unit.
1—36″ diameter x 44″ face
4—36″ diameter x 76″ face.
23—36″ diameter x 84″ face
14—48″ diameter x 48″ face with bearings
2—48″ diameter x 52″ face with frames, gears, bearings
2—48″ x 60″ face frames, gears & bearings
1—48″ diameter x 108″ face.
6—48″ diameter x 130″ face
1—60″ diameter x 92″ face, anti-friction bearings

EMBOSSING CALENDERS

1—43″ 3-roll Embossing Calender
1—48″ 2-roll Meadows Embossing Calender
1—51½″ 3-roll Smoothing Calender
1—57″ 3-roll Embossing Calender
1—62″ 2-roll Embosser
1—90″ 2-roll Smoothing Calender

FILTERS

1—Oliver, 8 ft. x 12 ft., rubber lined, complete
1—Oliver Filter 8 ft. x 8 ft.
1—Dorr-Oliver Filter, 3 ft. dia. x 6 ft. face, stainless steel construction, with pump

FLAT SCREENS

1—12 Plate "Packer"
4—14 Plate IMPCO, bronze vats

JORDANS

2—#1 Jones High Speed Jordans, Stainless steel tackle, A.-F. Bearings, motors.
1—#1 Jones High Speed Jordan
1—Jones Standard, new spare tackle, with 75 h.p. motor
1—Noble & Wood Monarch, Type D, anti-friction bearings
1—Noble & Wood Mammoth Jr., with spare plug
1—Noble & Wood Baby Jordan, anti-friction bearings, with 20 h.p. motor
1—#6 Miami, anti-friction bearings

KNIFE GRINDER

1—70″ Seybold

LABORATORY EQUIPMENT

1—Washer for 5 lb. Beater
1—24″ Saveall, stainless steel
1—20″ Fourdrinier Wet End & Press Section
1—Noble & Wood Cycle Beater with motor & stand
1—Williams Freeness Tester.
1—Cady Micrometer
7—Mullen Testers, motorized & hand operated
1—2 qt. Auto Clave, Stainless Steel
2—Elmendorf Tear Testers.
1—27″ High Solid Coater
1—Noble & Wood Baby Jordan, anti-friction bearings, with 20 h.p. motor
2—Emerson, Jr., No. 1 Jordans, anti-friction bearings
1—24″ diameter x 24″ face Stainless steel Cooling Drum
1—8″ x 8″ Elmes Hydraulic Press

MISCELLANEOUS

1—Shartle Hydrafuge, 1000 g.p.m. (with motor)

MOTORS

4—25 h.p. Westinghouse, totally enclosed, ball bearing, 705 r.p.m.

PACKAGING MACHINERY

1—Lynch Morpac Packaging Machine

PRESSAFINER

1—7″ Pressafiner, stainless steel construction, New 1955, with new spare motor

PRESS ROLLS

2—Chilled iron, chrome plated 9″ x 72″
1—Chilled iron, chrome plated 10″ x 74″

PULPERS

1—#1 Jones Pulp Master

PUMPS

1—Economy Fan Pump 6000 g.p.m. 20′ head, 50 h.p. motor

REELS

1—72″ Downingtown Reel, 2 bowl
1—84″ 3 bowl revolving reel
1—86″ 2 bowl reel
1—100″ Rice Barton 2 bowl reel, heavy duty
1—116″ Downingtown, 2 bowl, anti-friction bearings
1—123″ 3 bowl Revolving Reel
1—130″ Pope Reel (Rice Barton)
1—134″ 2 drum

REFINERS

1—Rice Barton Dynofiner, details on request
1—12″ Wiener Refiner, with 200 h.p. motor
2—36″ Bauer double disc #185E Refiners, each with two 100 h.p. motors
1—#4 Dilts Hydrafiner, anti friction bearings

ROLL HEADER

1—Valley Iron Roll Heading Machine, complete, for paper rolls 100″ long x 42″ diameter

ROLLS

Felt, Table, Press, Breast, Couch, etc. Various sizes and types. (Bronze, Rubber, Iron, etc.)

ROTARY SCREENS

4—#2A Bird Rotary Screens, copper vats
1—#2A—50 Bird, copper vat
2—APMEW Rotary Pulp Screens

SAVEALLS

1—#6 Bird Saveall.
1—24″ Continuous Saveall, stainless steel
1—LaMort 48″ diameter x 82″ face cylinder mold
2—Savealls, cylinder molds, 42″ diameter x 106″ face. brand new vats
1—Saveall, Rice Barton, cast iron vat, cylinder mold 48″ diameter x 128″ face, complete with 18″ diameter couch roll, all in very good condition

SHEETERS

1—160″ Moore & White, simplex, complete

SHREDDERS

1—16″ "Swift" Paper Shredder
2—Taylor Stiles Rag Cutters

SLITTERS & WINDERS

1—26″ Cameron Type 26-2A, with constant tension & electric eye.
4—42″ Cameron Type 6
1—42″ Cameron Type 9
1—42″ Cameron Type 26-2A
1—42″ Cameron Type 40-2
1—50″ Cameron Type 6
1—52″ Cameron Type 9.
1—86″ Two Drum Moore & White 50″ diameter rewind
1—96″ 4 drum Moore & White winder
1—64″ Waldron, Shear cut

SLITTING DEVICE

84″ Quick change slitting device shear cut, complete

SUCTION COUCH SHELL

1—Downingtown suction couch shell only. 127½″ face 26″ diameter

SUCTION COUCH ROLL

1—Beloit 36″ diameter x 246″ face, SKF bearings

SUCTION FELT ROLL

1—Gilbert & Nash 122″ face

SUCTION PRESS ROLL

1—Sandusky 18″ dia. x 138″ face Suction Press Roll

SUPER CALENDER STACKS

1—7 Roll 70″ face.
1—9 Roll 56″ face.

TOILET WINDERS

1—72″ Hudson-Sharp (Surface type winder)

TRIMMERS

1—95″ Seybold Trimmer, Model 15ZJ

VACUUM PUMPS

2—#3 Nash Hytors
1—#4 Nash Hytor
1—#7 Nash Hytor, with 75 h.p. synchronous motor
1—H-7 Nash
2—K-5 Nash
2—L-4 Nash
3—L-5 Nash
1—L-6 Nash

VATS

2—Brand new Downingtown Iron End Vats, for 42″ diameter x 112″ face cylinder molds. Will cut down to your size.

VIBRATING SCREENS

1—Hummer Vibrating Screen, Stainless Steel
1—Selectro, 2 Stage, 5 ft. x 10 ft.

WET MACHINES

1—84″ IMPCO Wet Machine

YANKEE DRYERS

1—60″ diameter x 92″ face, anti-friction bearings
1—12 ft. diameter x 181½″ face

Paddy Ross, Pres.

J. J. ROSS COMPANY

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Mr. E. L. Giffen
Personnel Manager
Scott Paper Company
Southern Division
Post Office Box 1189
Mobile, Alabama

J-2

ENGINEERS TECHNICAL SALES

We are seeking several engineers with pulp and paper industry experience interested in Technical Industrial Sales. Position requires sales contacts and engineering for handling systems and heavy equipment in the U. S. and abroad. Knowledge of dry end operations will be helpful. An engineering degree, or its equivalent in experience, plus an interest and ability to work with customers at upper levels of management are basic requisites. Must be willing to relocate to West Coast. Salary commensurate with experience. Resume should include complete personal and professional qualifications, present salary and photograph. Reply Box 61-113 care Paper Trade Journal.

J-19

Situations Wanted

***Production executive* — conversion of boards, paper & film. Well versed in heading up all production functions in an organization; or reorganization deal. Multiple manufacturing units. Employed — wishes change for challenging opportunity. Box No. 61-9 care Paper Trade Journal.**

J-26

FOLDING BOARD MILL MANAGER, now employed. Outstanding record for revitalizing border-line operations with improved profits and quality. Compensation required: Moderate salary plus incentives based on achievements. Address Box 61-103 care Paper Trade Journal. J-5

CHEMICAL ENGINEER — experienced product development, tech. service, conversion coating, quality control and project engineering. Presently employed. Age 28. Prefer Eastern U.S. Address Box 61-111 care Paper Trade Journal. J-12

Registered graduate engineer with twelve years of pulp and paper experience in machine design, plant design, and project management wants demanding work in a mill or machinery company. Has performed process design, complete job design, estimating, and client contact in engineering company and mill. Reply to Box 61-118 care Paper Trade Journal.

J-2

1—81" PAPER CONVERTING MACHINE CO. ROLL TOWEL MACHINE
Size—11 x 7½—positive perforation Model #460, #3100

1—36" HUDSON SHARP SINGLEFOLD TOWEL MACHINE
Model #B 57 PL 7

1—50" HUDSON SHARP SINGLEFOLD TOWEL MACHINE
Serial #669

3—PAPER CONVERTING MACHINE CO. NAPKIN DRESS BOX SEALERS

3—PAPER CONVERTING MACHINE CO. NAPKIN MACHINE
Model #1090 #490 — Model #473 #323 — Model #464 #314

2—PAPER CONVERTING MACHINE CO. FACIAL TOILET TISSUE WINDER
Model #1554A #954A — Model #1554B #954B

1—HEAVY DUTY UPSTROKE BALING PRESS
Economy—Model #160F4, with inside filling chamber 60" x 30" — 10 foot pit required below floor level — Unit equipped with sectional doors, retainer doors, wheel operated door locks and complete with 10 H.P. Special Baler Motor with brake attached. Unit is push button operated with reversing Controller, Overload Relays and Automatic Timer

1—SEYBOLD PRECISION GUILLOTINE CUTTER
Model #10ZF Serial #16958 — 65" Knife — Table 54" deep to knife

1—LAWTON TISSUE WRAPPING MACHINE

1—PAPER CONVERTING MACHINE CO. NAPKIN MACHINE
Size 17 x 17 — ¼ fold Model #1017 #417

1—81" PAPER CONVERTING ROLL TISSUE MACHINE
Model #125 #58

3—81" DIETZ PERFORATORS
With Combination heads for 4½ x 4½ — 11 x 7½ — 11 x 13½ with parent roll drives

7—81" ROLL TISSUE PERFORATORS
Size 4½ x 4½

2—42" HUDSON SHARP SINGLEFOLD TOWEL MACHINES
#1627 #1628

1—30" PAPER CONVERTING SINGLEFOLD TOWEL MACHINE
Model #463 Machine #313

1—PACKOMATIC CASE SEALER
Machine #807 — Job #675 Manufactured by J. L. Ferguson Company — Accommodates case 8" to 30" height, from 8" to 22" width. Fully automatic — Length of Dryer 20 Feet

1—72" DILLON SHEETER
Serial #B225 Simplex with 24 roll back stand. Dillon Layboy and Quire Folder #B-226

1—50" HUDSON SHARP SINGLEFOLD TOWEL MACHINE
Serial #1003

1—90" PAPER CONVERTING MACHINE CO. PERFORATOR
With combination cylinder — Manufactures all sizes Roll Tissue & Towels Model 295 #150

1—VERTIVAC-PAPER CONVERTING MACHINE CO. NAPKIN MACHINE
Model #252 #119 — ¼ fold — 13 x 13½ Vacuum Type Folder

1—PACKOMATIC CASE SEALER
Manufactured by J. L. Ferguson Co. #W0808 Job #675. Accommodates case 8" to 30" in height. From 8" to 27" in width. Fully automatic — Length of dryer 20 feet

1—58" PAPER CONVERTING SINGLEFOLD TOWEL MACHINE
Model #260 #148

1—58" PAPER CONVERTING SINGLEFOLD TOWEL MACHINE
Model #260 #146

2—88" PAPER CONVERTING MACHINE CO. ROLL TOWEL MACHINES
Size 11 x 7½ — Positive perforation. Model 460 #310A #310B

1—82" HAMBLET MACHINE COMPANY SHEETER
Serial #661 — 24 Roll Backstand — Duplex Cutter

1—MAXON-82" AUTOMATIC LAYBOY
Serial #1332797 Size 92" x 45"

1—54" HUDSON SHARP EMBOSSER
#840

1—54" HUDSON SHARP EMBOSSER
#821

1—LAWTON TOILET TISSUE WRAPPER
Serial #127

1—PRECISSION SEYBOLD GUILLOTINE CUTTER
49" Knife — Table 48" deep to knife — 5½" stroke

1—72" DIETZ PERFORATOR
With Combination Cylinder and Head — Sizes 4½ x 4½ — 11 x 7½ — 11 x 13½

2—72" DIETZ PERFORATORS
Size — 4½ x 4½

1—72" HUDSON SHARP THREE BAR PERFORATOR
Size 4½ x 4½

1—67½ DIETZ PERFORATOR
With Combination Cylinder and Head — Sizes 4½ x 4½ — 11 x 7½ — 11 x 13½

3—63" DIETZ PERFORATORS
With Combination Cylinder and Head — Sizes 4½ x 4½ — 11 x 7½ — 11 x 13½

1—63" DIETZ PERFORATOR
Size 4½ x 4½

2—STEEL TANKS
10'6" Diameter, 19'4" Long, 5/16" Plate. S-21 Heating Coil — 20" Manhole — 12,500 Gallon Capacity

2—GLUE MIXERS WITH HEAT UNITS
15" Wide — 14" Deep

3—LEWIS SHEPARD HAND LIFT JACKS
Type WMT Model 648-31358 — Cap. 2,000#

1—BARRETT LIFT TRUCK
Model POK 660 Serial No. 211236 — Cap. 4000#. Complete with battery charger

1—NOBEL AND JOHNSON MACHINE CO.
Jordan, Plug 35" long — Diameter 21"

1—TRIMBEY REGULATOR
Patent #2083

2—BEATER WASHER CYLINDERS
8 Sides — Size 18" x 42"

1—FARQUHAR COAL CONVEYOR
18" Belt — 30' Conveyor — Serial #Y-19066. Wisconsin Air-Cooled Engine V4 Cylinder

92" FACE ROLLS OF THE FOLLOWING:
2 Wooden Rolls; Jacks — 1 — Felt Roll — 1 Stone Roll. Manufactured by Improved Paper Machine Co.

2—GLUE MIXERS
38" Wide — 36" Deep

1—GLUE MIXER
Tub 24" Deep — 27" Diameter

1—HAND OPERATED BALER

Address Box 61-119 care Paper Trade Journal. J-5

For Sale

FOR SALE
LOW PRICES

2—86" B. & S. Wet Machines; Bronze and Rubber Press Rolls; A.F. Bearings on Couches and Cylinder Molds. Complete with Gear Drives. Excellent Condition.

RUDERMAN MACHINERY EXCHANGE
Gouverneur, New York
Phone 333-334

TF

For Sale

SHEETER — FOR SALE
98" MOORE & WHITE
LAYBOY — BACKSTAND

Can be seen running full time in our plant. This machine will be replaced with a new machine in July.—Must be sold.—Low cash price or terms available.

MELROSE PAPER CO., INC.
16th & Wood St. Phila., Pa.

TF

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Pigment Div. 34
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Ames, B. C., Company ..... —
Anglo American Clays Corp. .. 61
Anglo-Canadian Pulp & Paper Mills ..... —
Anglo Paper Products Ltd. ... 34B
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Antara Chemicals, Sales Div. Gen. Aniline & Film Corp. .. —
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Appleton Wire Works ..... —
Armco Drainage & Metal Prod. Co. 59
Armco Steel Corp. ..... —
Arnold Hoffman & Co. ..... —
Asten-Hill Mfg. Co. ..... —
Atlantic Coast Line R. R. .... —
Babcock & Wilcox Co. ..... —
Bahr Brothers Mfg Co. 61
Bailey Meter Co. ..... —
Bauer Bros. Co. 54
Becco Chem. Div. Food Machy. Corp. ..... 33 to 60
Beloit Eastern Corp. 34A
Beloit Iron Works Co. ..... —
B. I. F. Industries 31
Bird Machine Co. 29
Black-Clawson Co. ..... —
Black-Clawson International, Ltd. ..... —
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Carthage Machine Co. ..... —
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Cellulose Development Corp. .. —
Cesalpinia S.P.A. ..... —
Chemico ..... —
Cuba Company ..... —
Clark-Aiken Company ..... —
Clarkson Company ..... —
Classified Advertising 62
Cleveland Crane & Engrg. .... —
Columbia Southern Chemicals (refer to Pittsburgh Plate Glass Co., Chem. Div.) .... —
Combustion Engrg. Co. ..... —
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Crane Company ..... —
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Diamond Alkali Co. 1
Dixon Chem. & Res. Co. .... —
Dodge Mfg. Co. ..... —
Dorries, O., A. G. ..... —
Dorr-Oliver ..... 10 & 11
Dow Chemical Co. ..... 20 & 21
Dow Corning Corp. ..... —
Draper Bros. Co. 52
Dryden Paper Co., Ltd. 34B
du Pont, E. I. de Nemours & Co., Dyes & Chem. Dept ..... —
Electrochemical Dept. ...56 & 57
Pigments Dept. ..... —
Duverre Inc. ..... —
Easton Manufacturing Co. .... —
Ebasco Services, Inc. ..... —
Egan, Frank W., & Co. ..... —
Egger, Emile & Co. ..... —
Electric Mchy. Mfg. Co. ..... —
Elixman Paper Core Co. 61
Evans, W. P. & Son, Ltd. ... —
Export Supplement ..... —
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Farrel-Birmingham Co. ..... —
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Finckh, Herman ..... —
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Glidden Company 18C
Goodyear Tire and Rubber Co. ..... Cover 2
Gottesman-Central National Org. ..... —
Goulds Pumps 19
Great Eastern Packing & Paper Co. ..... —
Great Lakes Carbon Corp., Dicalite Dept. ..... —
Green, Inc., Frank B. ..... —
Greening & Sons, Ltd. ..... —
Grinnell Co., The ..... —
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Hunt & Moscrop ..... —
Huyck Felt Company 50E
Hyster Company ..... Back Cover
Improved Machinery, Inc. ... —
Ingersoll-Rand Co. ..... —
Inglis, John, Co. ..... —
Industriplanning ..... —
Itek Laboratories ..... —
Jagenberg U.S.A., Inc. 23
Jagenberg Werke ..... —
Jamesbury Corp. ..... —
Jenkins Brothers ..... —
Johnson, Alvin H., Co. 60
Johnson Corp., The ..... —
Jones, E. D., Corp ..... —
Kalamazoo Tank & Silo Co. ... —
Kamyr, Inc. ..... —
Karlstads Mekanika Werkstad . —
Kellogg, M. W. Company ..... —
Kenyon, James & Son ..... —
Kidder Press Co. 25
Knox Woolen Co. ..... —
Koppers Co., Inc. ..... —
Krauss-Maffei-Imperial G.m.b.h. ..... —
Lamb-Grays Harbor Co. ..... —
Lamort Fils ..... —
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Lestoil, Inc. ..... —
L'Homargy ..... —
Link-Belt Co. ..... —
Lob, Albert Maschinen und Apparatebau ..... —
Lodding Engineering Co. 18B
Lukon, Inc. ..... —
Lunkenheimer Co. ..... —
Lyddon & Co. ..... —
Main, Charles T., Inc. 60
Manchester Machine Co. ..... —
Marathon—A Division of American Can ..... —
McLean, Ltd. ..... —
Mead Pulp Sales, Inc. ..... —
Mecke, Klaus, & Co. ..... —
Merck, E., & Co. ..... —
Metron Instrument Co. ..... —
Miehle-Gross-Dexter ..... —
Miller Corp., Harry ..... —
Millspaugh, Ltd. ..... —
Mine and Smelter Supply Co. —
Minerals & Chem. Philipp Corp. ..... —
Minneapolis-Honeywell 6
Mixing Equipment Co. ..... —
Monsanto Chemical Co. ..... —
Montmorency Paper Co. 34B
Moore & White ..... —
Morden Machine Co. 53
Mt. Vernon Mills, Inc. ..... —
Multi-Amp Electronic Corp. .. —
Multi Metal Wire Cloth Co. .. —
Murray, D. J., Mfg. Co. ..... —
Nalco Chemical Co. ..... —
Nash Engineering Co. ..... —
Nashua Industrial Machines .. —
National Aniline Div., Allied Chem. Corp. ..... —
National Starch & Chemical Corp. 7
National Tube Div., U. S. Steel Inc. ..... —
Newport News Shipbldg. & Dry Dock Co. ..... —
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Nichols Eng. & Research Corp. ..... —
Nopco Chemical Co. ..... —
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Paper Industry Management Assn. ..... —
Parsons & Whittemore ..... —
Patton Mfg. Co. ..... Front Cover
Penick & Ford ..... —
Penobscot Chemical Fibre Co. .. 16
Perkins Goodwin Co. ..... —
Pfaudler Permutit Inc., Permutit Div. ..... —
Personnel Service Assoc. .... —
Pioneer Paper Stock Co. ..... —
Pittsburgh Plate Glass Co., Chem. Div. ..... —
Potdevin Machine Co. ..... —
Powell Valves 17
Price & Pierce, Ltd. ..... —
Rauma Repola Oy ..... —
Raymond, Charles P., Service —
Rayonier, Inc. ..... —
RCA Industrial Electron Prod. 14
Record Fdy. & Mach. Co. .... —
Red Ray Mfg. Co. ..... —
Rhoads, J. E., & Sons ..... —
Rice Barton Corp. 26
Riedel, Gus & Son ..... —
Riegel Paper Corp. ..... —
Robbins Instrument Co. ..... —
Rockwood Sprinkler Co. ..... —
Rohm & Haas Co. 13
Ronningen-Petter Co. ..... —
Roosevelt Paper Co. ..... —
Ross, J. J. Co. 63
Ross, J. O., Engrg. Co. ..... —
Ross Midwest Fulton Corp. .. —
Ross Paper Machinery Co. .... —
Ruderman Machinery Service .. 65
Rust Engineering Co. 60
Sandoz Chem. Wks. .....50C & 50D
Sandy Hill Iron & Brass Wks. —
Scapa Dryers ..... —
Seaboard Air Line R. R. Co. .. —
Shawinigan Resins Corp. 9
Sheffield Corp. ..... —
Shuler & Benninghofen ..... —
Signode Steel Strapping Co. .. —
Sinclair Company ..... —
Sirrine, J. E., Co. ..... —
Smidth, F. L., & Co. ..... —
Smith & Winchester Mfg. Co. . 54
Solvay Process Div., Allied Chem. Corp. ..... —
Sonoco Products Co. 35
Southworth Machine Co. 15
Spraying Systems Co. ..... —
Sprout Waldron & Co. ..... —
Stadler Hurter & Co. ..... —
Staley Mfg. Company ..... —
Starch Products, Ltd. ..... —
Stebbins Engrg. Co. ..... —
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St. Regis Paper Co., Kraft Div. ..... —
St. Regis Paper Co., Panelyte Div. ..... —
Sturge Ltd., John & E. ..... —
Sulzer Brothers ..... —
Sunday, George M., Assoc. .. 62
Taylor Instrument Co.'s 50F
Taylor-Wharton Company .... —
Tennessee Corp. ..... —
Texaco, Inc. 22
Texas Gulf Sulphur ..... —
Thermal Equip. Corp. ..... —
Thiele Kaolin Co. ..... —
Thiry & Company ..... —
Thomas Paper Stock Co. 61
Thompson, John, Co. ..... —
Titanium Pigment Corp. ..... —
Torrington Co. 12
Tyer Rubber Corp. ..... —
Tyler, W. S., Company 8
United Engrg. & Fdy. Co. .... —
Universal Metal Hose Co. .... —
U. S. Industrial Chem. Co. Div. of National Distillers & Chem. Corp. ..... —
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Vapo Systems Co. ..... —
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Voith, J. M., G.m.b.H. ..... —
Waldron-Hartig Div., Midland Ross Corp. 55
Wallingford Steel Co. ..... —
Walworth Co. ..... —
Wartsila Koncernen A. B. .... —
West End Chemical Div., Stauffer Chem. Co. ....Cover 3
West Va. Pulp & Paper Co. .. —
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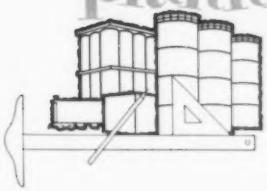

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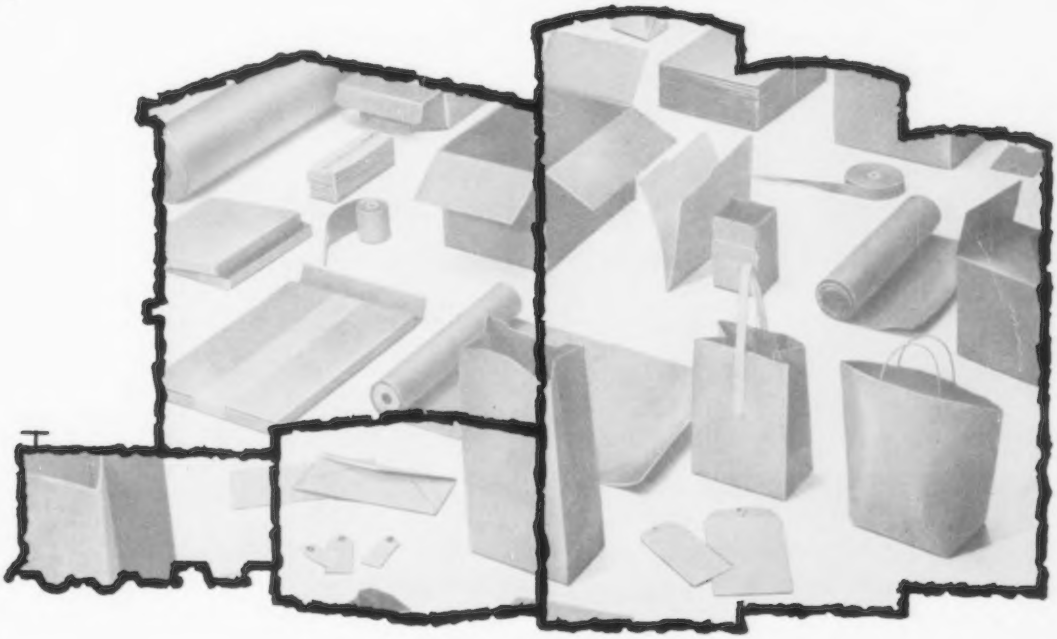

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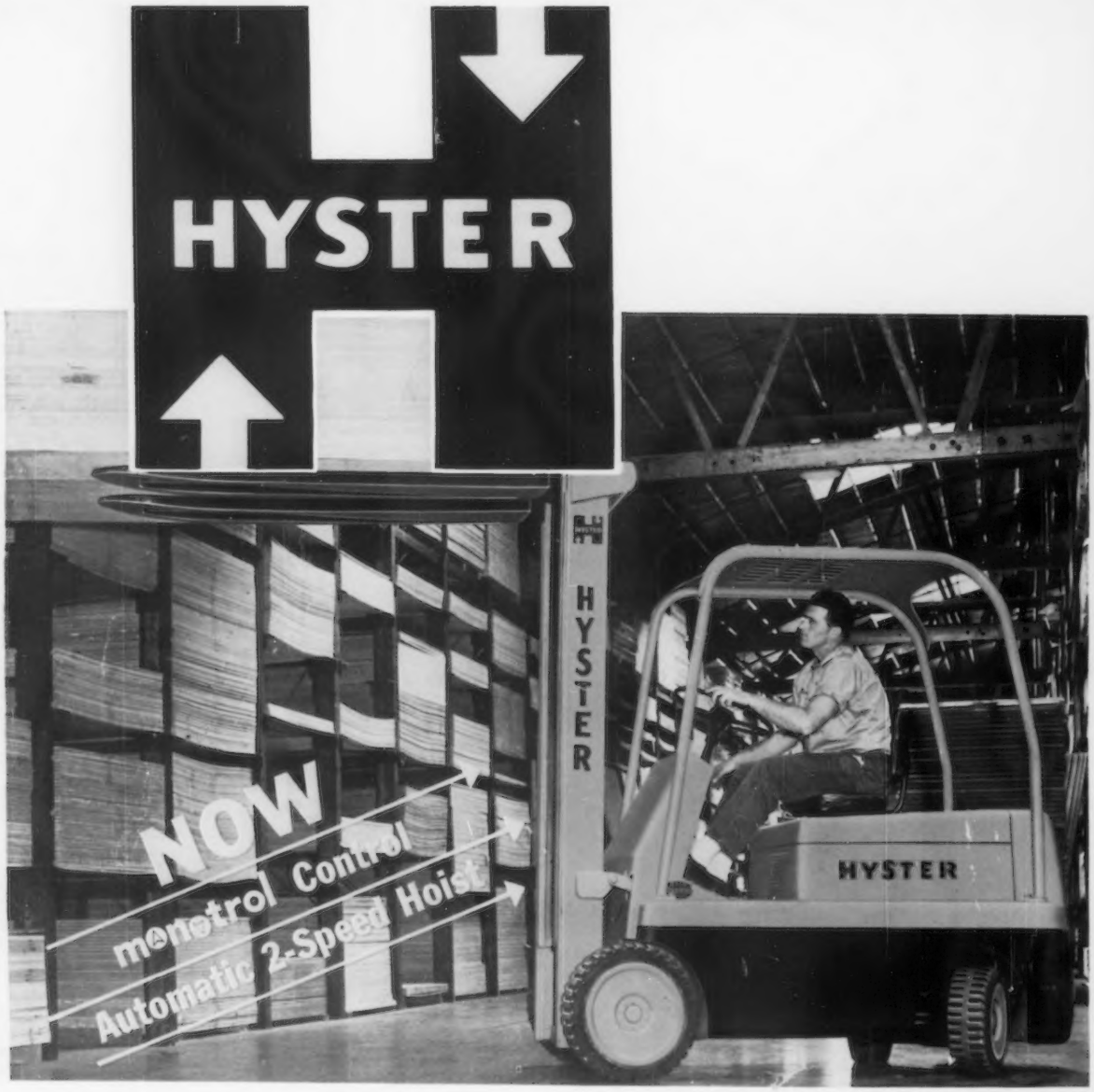

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